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"I cannot help plead to my countrymen, at every opportunity, to cherish all that is manly and noble in the military profession, because Peace is enervating and no man is wise enough to foretell when soldiers may be in demand again."—GENERAL SHERMAN.

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NOTES ON TRANSPORTATION BY A MEMBER OF THE CHINA RELIEF EXPEDITION.

BY FIRST LIEUT. JOSEPH A. BAER, 6TH U. S. CAVALRY.

WARS of the future between great powers will, to a great extent, be fought out in the supply departments of the belligerents. Unlimited resources and prodigality of allowances alone will not suffice. Prompt, systematic, and sufficient delivery will be the criterion by which success will be measured. The heavy packs now put on the cavalry horses and men, must be lightened to gain mobility in the field and this large amount of baggage must be taken care of by a larger and more efficient transport service. Efficiency will be attained by a thorough organization of the transport service, subdividing, systematizing, and officering it as minutely and as thoroughly as is the Line.

An unequaled opportunity to study this problem presented itself in the camps of the Allies before Pekin during the summer and fall of 1900. All information that could be divulged was courteously given by the officers of the different nations and except in the case of the Russians, ample opportunity was given to examine the various systems. The Russians left Pekin before the general settling down, and we could find nothing about their system beyond the fact that they used large lumbering carts, four horsed wagons and a light wagon with

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the typical Russian arch, 3 feet high, from shaft to shaft over the horses' necks.

In all the various systems the one point that stood out in sharp contrast to our system, was that in all the armies except our own, officers and men are not drawn from the line to piece up a staff corps. The teamsters and packers are all enlisted men, enlisted for such service, wearing a special uniform, organized and amenable to discipline. Each General Staff has a force of men enlisted as clerks, telegraphers, orderlies and each regimental and battalion staff has a force of such men together with a force of enlisted men as assistants, storekeepers, drivers, porters, etc., in the Regimental Quartermaster and Commissary Departments. When the strength of a company is given at 250 in the French army, it means that except the sick and necessary guard and fatigue, there will be 250 men for duty and not as in our service the strength of 106 cut down to 45 and 50 by a multiplicity of special and extra duty details filled by men who do not know and have not the time to learn the duties to which they are detailed. Officers detailed to the various staffs were taken from organizations not forming part of the expeditionary forces, leaving the regiments fully officered and with their full quota of men.

As when campaigning in Europe the Germans relied upon the railroads for their main transportation and did not seem able to adapt themselves to new conditions of field service. For rations for the troops on the march or in the field and for baggage and kitchen utensils each company has three wagons, the regimental staff one and the battalion staffs one each, making 34 to the regiment of nine companies, 204 men to the company.

The regiments carried no canvas, except shelter tents, relying on billeting in the towns for shelter and for the most part "commandeering" or "requisitioning" for their rations when in the field. Under such conditions 34 wagons per regiment should be sufficient. But when the railroad was not in operation the German commissariat broke down, mainly through want of adequate transportation. After the railroad was repaired the Germans had charge of it for a time. The officers assigned to duty on the road ran it very creditably, enlisted men driving the engines and acting as brakemen, porters and guards.

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Supplies were handled expeditiously and they gave evidence of being able to properly supply a large army in a country well intersected by railroads. Before the railroad was repaired, junks on the Peihio and Chinese carts on the wagon road carried supplies from one magazine to another. I did not observe any organized trains of army wagons, hauling for the Germans. The regimental army wagon is much inferior to ours. The wheel base is six feet wide. The bodies are very wasteful of space, being deep and narrow, 3′ wide at the bottom, with sides sloping outwards one foot and a half. The tongues swing about 18″ from the ground and the traces are exceedingly long, the hocks of the horses being four feet from the swingletrees. Either two or four horses are used in them.

In the French army, army wagons, Chinese carts and coolie carriers made up the trains between their depots. For their regimental transportation, each company had one wagon for baggage, ammunition and rations, each battalion one ambulance, one ration wagon, one sutler's wagon; with the regimental train thirteen wagons for rations, four wagons for ammunition, tools, etc., one baggage wagon,—33 wagons, 3 ambulances, and 3 sutler's wagons. These were in charge of a regimental transport officer, under whom were one transport sergeant, one teamster corporal and 51 teamsters. A French infantry regiment numbers 12 companies and 3000 men.

It will be noticed that each company wagon carries ammunition. Each soldier carries 120 rounds in his belt and when going into action draws 40 rounds more from the company wagon, which he stores in his pocket, leaving 25 rounds per man still in the company wagons as a first reserve in the hands of his company or battalion commander. In the regimental train there is a reserve of 8000 rounds and in the ammunition trains enough to make up a total of 300 rounds per man. The pouch ammunition belt is adopted by all the European armies. The Australian contingent alone wore a belt such as ours. With our belt the cartridges are exposed, have their lubricant worn off and their shape altered by continual rubbing and are constantly dropping out. Especially is this the case in the mounted service. Here also the jolting in the small of the back that a loaded belt weighing over eight pounds gives is

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highly injurious. Shoulder straps to take the weight off the kidneys and abdomen should be adopted. Or, better yet, would be a belt of fair leather with three pouches and slings, as in the Japanese army. Each pouch could hold two of the pasteboard boxes in which ammunition is now issued. Refilling such a belt on the firing line would be a simple matter. The boxes could be kept sealed as issued when not in action, and simply pulling the opening string would make the pouch ready for use. Such a belt would hold 120 cartridges in good condition and would not leave a trail of Krag-Jorgensen cartridges, along the route of march, to supply a guerrilla enemy with ammunition as in the Philippines.

In the Japanese army the soldiers are billeted and a saving made in the transportation of canvas. The ration weighs 2¾ lbs., slightly more than half what ours weighs packed. They are very liberal in their number of men enlisted for special duties. The special and extra duty details for the regimental offices, Quartermaster and Commissary Departments, are filled by men enlisted in the staff—6 in the regimental staff and 71 in the battalion staffs.

Transportation is divided into that on the line of communications between magazines and that from the last magazine to the line. The latter has its drivers and packers armed. With each infantry brigade is a battalion of commissariat. This is divided up, furnishing 5 sergeants, 60 men and 60 pack animals to each battalion of this line, 880 men. They pack commissary stores from the last magazine to the troops. On the line of communications are men of the transportation service, uniformed but unarmed. In an emergency these men may be armed and used in the line. Pack and cart transportation are used on the line of communications. The cart is very light, drawn by one pony and attended by one man. The pack saddle consists of two sides padded with hair or straw, joined by two iron arches. The pack is tied on or slung over the saddle. For a division of 18,000 combatants, there are 4,000 non-combatants and 6,000 ponies. Their supplies are put up in light boxes, packed to weigh about 90 pounds, and clearly marked with contents and weight.

The British Indian army had the most thoroughly organized

JAPANESE PACK HORSE.

BRITISH INDIAN PACK MULE.

transport system of all the forces before Pekin. Every year this army is in the field against some refractory mountain tribe and the necessities of the case have naturally evolved a most thorough and efficient system.

The British Indian soldier is essentially a fighting man. On the march he carries nothing but his gun, ammunition and canteen. On short expeditions, when so ordered, he takes his rations. The ration consists of flour and oil or butter of which each soldier mixes and bakes in the ashes of his fire, a sort of bread called, "Chepatties"—a cross between a "hoe-cake" and "flannel cake." Four to five days rations can be carried in the can or pot which serves him as a culinary utensil. Mutton is issued once a week—transported on the hoof. When transportation is limited each soldier carries his great coat wrapped in a roll. This serves him as a blanket. Tents, shelter tents, changes of clothing, shoes, camp equipage in general are carried for the man, and the man is left to perform his proper duty—that of a fighting man and not that of a pack animal. Even the work of carrying water is lightened. The canteens are small and the main supply of water is carried in skins on water mules.

The fighting men of India are men of means and caste. For instance, the cavalry trooper makes a deposit of 250 rupees upon enlistment, from which his horse is purchased, and out of his small pay of 17 rupees per month, forages his horse and buys his rations, except when in the field. It is beneath their caste to do menial work. They have the menial work performed by coolies while their profession is fighting. Indeed, with their classical features, dignity and courtesy, they remind one of the days of Knight errantry. Their system of camp followers or "bearers" gives in the cavalry one grass cutter and mule to every two men, besides a number of public and private bearers. Upon reaching camp, the grass cutters cut green forage for the animals, a number of followers being left in camp for menial work. On the march the grass cutter looks out for the baggage of the two men for whose horses he cuts grass and generally performs striker duty. In a cavalry regiment of 483 sabres, there will be 263 public followers and 56 private followers. In an infantry regiment these figures are cut down considerably, but a large number of followers perform the menial work.

The numerous staff of the British contingent was made up of officers detailed from regiments not in China and the staff detachments were complete in stenographers, typewriters, experienced army clerks, telegraphers, orderlies, laborers, etc.

By relieving the men of their packs which all other armies use, an exceptionally large amount of transportation is required. Owing to the greater part of their fighting being done in the mountains, the mainstay of their transportation is the pack animal. To the depots along the military roads and wherever the roads will permit, camels, coolies and carts are used.

These carts are drawn by animals trained either for draught or pack. They are fitted with a combination draught and pack saddle, so that in an emergency, when the carts cannot be brought up, the draught animals can pack sufficient supplies to the front to tide over.

The animals used are small mules ten to eleven hands high, trained for both pack and draught. They travel in a short walking trot, whose chief recommendation is a smoothness, which is necessary with packs that are merely hung on. Three to three and a half miles per hour is their usual speed.

Their gallop is used only with draught. They always travel in strings of three, each three with its driver. The lead or near mule has a snaffle rein by which he is either led or driven. Each of the other mules has a ring in front of the muzzle bands of his halter, by which he is attached to the cantle of the saddle of the mule in front. This saddle consists principally of a pair of side bars 16″ long, joined by two steel arches. In the new ordnance saddle, these arches are connected by three rods of steel of which the top one is bent double upon itself, twice forming a "D" shaped loop with a small opening along the top. This is closed with a latch and hook. The arches have also two hooks upon their sides, so arranged as to admit of the packs being hung upon them. The side bars rest upon two pads 18″ by 14″, about 2″ to 2½″ thick and packed with hair. The inner surface and sides are made of canvas, the outer surface of thick leather. A hole is cut in this leather and covered with a flap that buckles tight. This hole is to allow the driver to remove, pick, and repack the hair stuffing once a week when on field service, to keep it soft and to fill in the animal's back,

as it loses flesh. The pads are attached to the side-bars by straps. The leather covering of the pads has breaching and breast straps attached to prevent the saddle and load from slipping. There is also a crupper. The saddle is fastened to the body of the animal by a girth with strap and buckles.

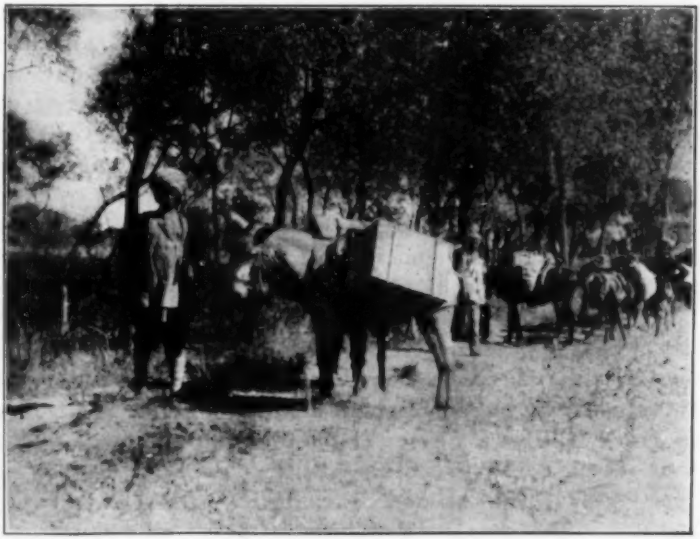
The animal's halter has a fringe of cord that hangs down over the eyes as a protection against flies. In addition, each animal has a blanket or a cover, a set of cargo ropes, and each set of three, a grass net and the necessary grooming apparatus. The cargo ropes consist each of two pieces of rope joined with a yoke of rope or leather. There is a loop or ring in one end of each.

The cargo is made up into sacks, packages or boxes of 80 lbs. each. Each sack is tied up with a cargo rope, in such a way that the end loops or rings project to hang the packs onto the hooks on the steel arches of the saddle and take up all slack of the lashing due to the shaking and jolting incident to the march. The packs are hung one on each side of the animal.

The carts consist of wood and steel bodies mounted on two 4′ wheels. The body has only floor and sides, no footboard or tailboard. Neither floor nor sides are solid, but formed of longitudinal strips and bars of wood and steel. The tongue has a batter bar for the traces and when the floor of the cart is level inclines upward at an angle of 35 degrees, bringing the end of the tongue level with the top of the saddle. At the end of the tongue is a bar connected to it by a ring and swivel. The ends of this bar are placed in the before mentioned " D " loops in the top rod of the pack saddle and latched in. Two guards 4″ apart, on each end of the bar prevent it from slipping in or out and still give some play to the tongue. Traces are fastened to the lower rear corner of the pads. Reins are added for driving. Cargo is roped in the cart. The load is from 400 to 600 lbs. The combination saddle weighs 63 lbs. complete. Regiments have provided out of their regimental funds, pack saddles of a lighter construction some for pack only weighing 18 lbs. or slightly more.

The mules are first broken to lead in sets of three with empty saddles. The coat on the back is kept short by grooming, in winter clipped. If the animal's back shows signs of being

BRITISH PACK MULES.



BRITISH PACK MULE CARRYING 2 STANDARD 80-LB. BOXES.

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tender it is hardened with vinegar. When the string leads well dummy loads are put on and increased until the full load of 160 lbs. is attained. The string of three is broken to walk, trot, gallop, and take hurdles with their loads. They have very short, smooth even gaits, and the loads when properly hung do not fall off at these advanced gaits as readily as would be supposed. For example, when carrying grass the load is never tied on. If the grass is short the net is used, if long like straw it is merely piled on the mule's back transversely to a height of three or four feet. The driver, barefoot, twists the mule's tail around his great toe, steps to the mule's rump, then to the top of the load and trots off. The driver and load preserving their place without any difficulty by balance and the smoothness of the gait.

For transportation of rations accompanying the troops, each infantry battalion has 84 mules and 102 camels. When camels are not practicable, a sufficient number of pack mules or carts are substituted to make up the transportation. The camel train or its substitute works between the last depot and the line. The mules are with the regiment, 7 strings of 3 mules each constitute a section and is assigned to a company. Each section is in charge of a non-commissioned officer, and the battalion train is under a transport officer. In the cavalry regiments the transport consists of one officer, two non-commissioned officers, 59 drivers and mules and one grass cutter and mule for every two horses. This is in addition to the camel transportation. On the line of communications, between depots, camels, coolies, mule cart and bullock cart transportation is used. Each train is divided into sections under native non-commissioned officers and the train under an English sergeant. The main transportation of a division is under two officers, one a major, the other a captain.

For a division of ten thousand fighting men, there are seven thousand, seven hundred and fifteen public followers and twelve hundred and forty-five private followers. Of these, 4300 belong to the coolie corps, 3000 of the total number, 8960 are with the line. This enormous number of camp followers is possible with the British-Indian army, owing to the small pay required, and small quantity of rations consumed by the coolies. They use

no alcoholic beverages, and this, with their caste system, makes them quiet in camp and amenable to discipline.

The British-Indian transport manual gives complete tables of baggage and camp equipage, allowances for men and officers for every kind of the service. These are graded according to the kind of service, terrain, roads, size of organization, etc., and prescribe what shall be carried on the person, what in the pack, and what in the general transportation. Weights of packs are prescribed and baggage weighed and checked off before starting. The supplies, quartermaster, commissary and medical are all put up so as to allow their being divided to furnish a complete supply unit for any detachment that may be sent out.

The complete regimental field kit is kept at the regimental depot, and within two hours after the orders to take the field have arrived, any size of organization, from the regiment down to the squad, can move from its cantonment fully equipped for any length of service. All supplies are packed in boxes or bales weighing 80 lbs. This weight is large enough to allow of economical packing, and at the same time being light enough to allow one man to load a cart, pack a saddle, or handle all cargo in case of accident to cart or mule. The hospital supplies are so packed that the regimental supplies may be divided and a battalion detached, taking a full supply of medical stores for the battalion. This battalion store may be further sub-divided, permitting the detaching of a complete stock for each subdivision. Other supplies are packed for transportation by the same system.

The British-Indian army has but one supply department, in which is a transportation corps. Its quartermaster, subsistence, ordnance, medical supply, etc., are in the one department, the Army Service Corps. This centralizes the general supply of the army. There is no rivalry of the various branches to get the necessary transportation held in our army by the Quartermaster's Department. The different branches provide the various supplies, and they are transported by a branch which can have no reason for favoritism and which will transport all supplies as fast as they are needed under the direction of the head of the General Supply Department. In our army transportation should be taken from the Quartermaster's Department and or-

ganized as a separate corps. All supply departments should be consolidated into a General Supply Department, the transportation corps being under the orders of the head of this department. That such a system would be a good one is borne out by the working of small posts where the quartermaster, commissary, and ordnance departments are under a single officer. Here no set of supplies has preference. Transportation is used where it is immediately needed, and the various departments work in harmony.

Such a consolidation need not take from any department its present functions. But it would save much paper work from the line, whose duty is not to be clerks but fighting men. All the sub-departments would purchase and manufacture their supplies as at present. Requisitions would go direct to the Supply Department. The Supply Department would provide from the Quartermaster Bureau the quartermaster's supplies; from the Ordnance, the ordnance stores, etc. Then ordering sufficient transportation from the Transport Corps would transport the stores.

Returns would be made to one head,—the Supply Department, instead of to the present multiplicity of heads. The effect of such a centralization would be to more thoroughly regulate the purchase and distribution of supplies, to curtail the present amount of paper work necessary to obtain and account for supplies, and to increase the efficiency of the Supply Departments.

The Transport Corps in the field should be divided into two parts—that along the line of communications, and that marching with the fighting line. Transportation to the theatre of operations would of course be by rail or water. A main supply depot would be established at some convenient point on the edge of the country to be operated in. If railroad systems intersect the country, supplies would be furnished by rail, secondary depots being pushed forward, never more than two days' march behind the army, and as close to the advance units as the repair of the road will permit. When rail transportation becomes impracticable, these secondary depots would be pushed forward two marches apart, and each one, as a new depot is established farther to the front, would become a forwarding depot for the line.

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If the roads are found in good condition, the depots may be farther apart, and as the railroad is repaired or built the depots would be abandoned, sending their transportation and supplies on ahead. There would be a Chief Supply Officer on the corps or army staff in charge of the general supply of the troops, and under him a Chief Transport Officer having the general direction of the transport. At each secondary depot would be an officer of the Supply Department or Transport Corps having charge of the depot and trains and line of communications between his depot and the one next to the front.

The teamsters should be men enlisted as such, organized into a corps and armed with revolvers. Twenty-five wagons should constitute a section under a mounted teamster corporal. The train should be under a train sergeant. The infantry escort could be either mounted or could march alongside. A mounted infantry escort would furnish advance and rear guards and flanking detachments. If the roads were impracticable to wagons, and pack trains were necessary, the packers, enlisted, should be armed with carbines and revolvers. The present allowance of 12 packers to 50 mules should be doubled—50 mules with their packers forming a section under a corporal and the train under a sergeant. They should be instructed in advance and rear guard and scouting duties, and extended order tactics, so as to furnish their own escort and form a "fighting transportation."

If the army were not living off the country, four days' rations should be carried with the troops. An army wagon will carry 2500 pounds, with forage for its mules for five days. An allowance of one wagon to a company and one to each battalion and regimental staff,—16 wagons to a regiment—would give one day's ration on the man, four days on the wagon, kitchen utensils, etc., and 4000 to 6000 rounds of ammunition to the company. This is a liberal allowance and would permit free and rapid action, not tying the troops too close to their secondary bases. Pack transportation would be required with cavalry regiments. The regimental trains would be organized as the trains on the line of communications. With each regiment of the line would be a supply officer (captain) and three battalion assistant supply officers (lieutenants). When the battalions

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are not detached, one of the assistant supply officers would act as transport officer, in charge of the regimental train under the supply officer.

The personnel of the supply departments and the staff detachments should be made up of men uniformed, armed and trained for the various duties. Men could be assigned to the corps upon enlistment; men having had experience enlisted as clerks, etc., assigned to the offices. Men falling below the mark as intelligent soldiers being assigned as laborers and teamsters in the Supply Department. If it were impracticable to increase the size of the army by adding such a number of men to the regiments and supply departments, it would be much better for the *morale* of the army to decrease the number of men in a company and enlist permanently and train the number thus gained, for staff detachments, teamsters, packers, and laborers. By the present system of details the company is drained of good men, until the company drill is scarcely more than a squad drill. The best men, the men whose presence adds to the tone of the company, are always the ones taken away, leaving you with the scum of the organization. These men may come back after a time, but if they do they have lost their training, forgotten their drill, and their semi-familiar associations with the officers as clerks, etc., in the offices, leaves them spoiled and worthless as soldiers. In the offices detailed men are as a rule inexperienced, and their working worth is small. Their number is necessarily increased until they get into one another's way and do less work, and that more unsatisfactorily than a smaller number of trained men. Companies not subject to these details, even though smaller than at present, would prove a much more satisfactory unit, being always at hand, when called upon, to show the result of their training and instruction.

COMBINED ARMY AND NAVY OPERATIONS.*

By Major JOHN P. WISSER, Artillery Corps, U. S. A.

THE coming manœuvres on the New England coast naturally inspire military or naval men with an interest in recent European manœuvres of a similar kind. A consideration of the latter discloses the fact that while England and France (aside from purely naval manœuvres of fleet against fleet) devote their attention to the attack and defense of the coast in their manœuvres, Russia, Austria, Germany and the other nations are practicing combined army and navy operations on a large scale.

The importance of combined operations has greatly increased in late years. Fifteen years ago, Moltke and the other great strategists still regarded landings and operations with large landing forces as minor operations in war, but to-day they constitute the most important problems the army or navy staff has to deal with. History shows that none of the forms of attack by fleets alone on fortified places—Blockade, Bombardment or Direct Attack—give much promise of success, and combined naval and land attacks are the only ones insuring decisive results. This fact has been emphasized by the four most recent wars: the Chino-Japanese, the Spanish-American, and the Second Boer Wars, as well as the late Chinese Expedition, all of which illustrate the transportation of armies over sea on a large scale, together with combined operations; and in future, wars between nations possessing navies will be sure to bring about combined maritime operations, involving the difficult problem of convoy. It is for this reason that the nations of Europe are practicing combined operations in their manœuvres.

* The material of this article was derived from the author's work, "The Tactics of Coast Defense" (Hudson-Kimberly Co., Kansas City, Mo.) just completed.

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Combined naval and land operations are necessarily directed against the unfortified coast regions in their inception, their object and purpose being either to support the great land army that has been launched into the enemy's country by threatening the flank or rear of the enemy, or an important political or strategic point, or to assist in the attack on a fortified harbor by advancing against its land side.

The conditions, so far as combined operations are concerned, have changed considerably with time. The victories of Farragut in the Civil War, indeed, appear to contradict the view that direct naval attacks on forts are no longer possible, but it must be remembered that in his time the conditions for forcing a harbor entrance, on account of the different relative values of ships and coast artillery, were much more favorable than at present, and yet, even Farragut himself often asked for and received the support of artillery attacks from the land side.

The influences of time and space have also changed. In the days of sailing vessels they were very great, but with the introduction of steam the radius of action increased, consequently the effect of time and space on the ability of the fleet to control any particular sea area was diminished, and this diminution has continued, until to-day the entire ocean has practically become the contested sphere of action.

Finally, it is only in the last few decades that steam has displaced sails to such an extent as to permit of the use of steamers alone, for the transportation of large forces of troops, and their greater independence of movement allows of more definite plans being adopted, and introduces new elements in operations over sea.

But, however much conditions may change, there are certain strategic principles that always remain true.

One of the most important of these is that across any portion of the sea which is still in dispute by the opposing fleets, or only partially under control, attacks against the enemy's land domain cannot be made.

Innumerable historical examples may be cited to prove the truth of this maxim. In all cases where the control was not complete the land attacks had to be broken off because the

section of sea involved, although temporarily and locally controlled by the attacker, was suddenly again disputed by the enemy's fleet. Nevertheless, nothing great is ever accomplished in war without some risks, consequently troops will probably still be transported over sea, even if the latter is not entirely free from hostile ships, the convoy being properly organized to meet attacks and to resist them with the least loss.

The control of the sea must be sufficient not only to enable the attacker to begin and execute his attack, but also to hold the captured points, because the fleet is the only base the army has at this stage of the operations. A landing operation on a hostile coast is only possible when the attacker's naval forces are superior to those the defender can oppose to him at the critical moment, that is, in the decisive naval battle. After the landing is effected even a naval victory will not help the defender, if he has not sufficient available land forces to repel the invasion. Consequently, the superiority must be effected in the first place and maintained till the army has established its own base.

Temporary and local sea power is sufficient for sudden dashes only. The weaker the captured place is, the shorter must be the line of communications connecting it with the strategic point of support of the fleet, and in order to use such weak captured places as points of support, the fleet of the attacker must be able to secure *permanent* sea power at once.

Another important principle is that before and during the attack the enemy's naval force, should, if possible, be confined by blockade.

The conduct of the attack itself should be: *at sea*, in the hands of a naval officer, *on land* in the hands of an army officer, but a spirit of intelligent mutual coöperation should always be fostered. One of the greatest difficulties in such operations arises from combining forces from the two services, the army and the navy. The only way to cultivate the proper feeling, and to avoid friction, is to practice such operations in time of peace.

Finally, the principal attack on fortified places falls to the land forces.

These are the strategic principles governing combined operations.

One of the first conditions for success in such operations is the power to utilize favorable opportunities, in order to effect the landing with secrecy and suddenness, but this requires *preparation*. Part of the necessary preparation may be made in time of peace, the most important being the collection of information by the Intelligence Bureau, partly by naval officers and partly by army officers, and the preparation of maps. A plan for mobilizing the forces required should also be prepared beforehand, as well as plans for enlarging stations, docks, etc., and the material necessary to convert merchantmen into transports, as well as that needed in lading and unlading, should be collected in the depôts, ready for shipment.

Every nation should, in time of peace, take the necessary steps to enable her to command in time of war the required number of merchantmen for operations beyond sea. Even Great Britain, by neglecting this precaution, had great difficulty in obtaining the ships required for the earliest transportation in the Boer war.

In time of peace, all preparations are kept as secret as possible, and consequently proceed deliberately, but when war opens they are pushed forward with all energy, since secrecy is no longer so important; the element of surprise is not so much in the opening of operations as in their rapid execution.

The battle-fleet is first mobilized and sent out, then the convoying warships are designated and the merchantmen converted into transports, and finally the troops are mobilized, concentrated at the embarkation harbors, and embarked. The time required for the conversion of the transports varies considerably, but a few data are available for calculations. Great Britain took 4 days to arrange her transports for infantry and 7 days for cavalry and artillery, for transportation to Cape Colony. Germany required but 2 days to unlade the merchant steamers prepared for the China expedition, convert them into transports and lade them again. Authorities give 1 day for infantry and 2 for cavalry or artillery, as sufficient.

The question of command is one of the most important subjects connected with combined operations. The safest rule ap-

pears to be that the navy shall command from shore to shore, and on shore the army. In lading, the army must determine the order in which the different articles are stored, which should be the reverse of that in which they will be required on landing, and should insure each organization having all its needed material on its own transport, but the navy must have charge of lading itself, so far as it concerns the economy of space and the safety of the ship.

The transport capacity of a vessel is usually taken as 60 per cent. of her total capacity, but both Great Britain and the United States, in the recent experiences, exceeded this limit. For long sea voyages 4 tons and 52 cubic feet of space are allowed for each man, 8 tons and 126 cubic feet for each horse. For short voyages these figures may be considerably reduced.

In 1894 Japan transported 43,000 men and 8,000 horses, with provisions for six weeks, on 74 steamers. In 1898 the United States took 15,400 men, with a small number of horses, on 35 transports to Santiago. In 1900 the German expedition to China required for the transportation of 21,622 men over a distance of 12,350 nautical miles (in about 50 days), 20 steamers of a total of 116,759 registered tons, or about 5.4 tons per man.

It is a remarkable historical fact that no attempted landing of troops on a hostile coast has ever been prevented. This is due to the fact that the attacker has the initiative, and can select his point of landing. Hence, by keeping the real point secret up to the last, which he can readily accomplish by the mobility of his fleet, he can then, under the protection of his long-range ships' guns, concentrate more troops at the real landing place in a given time than the defender.

A harbor is, of course, the most favorable landing place, and next in order a well-protected bay, but the former would probably be fortified and the latter carefully watched, consequently the open coast is usually forced on the attacker. A landing on an unguarded coast may sometimes be secured by selecting for that purpose the neighboring coast of a neutral country, as France had planned to do in 1870 by landing a force on the coast of Denmark to threaten Germany.

The first necessity on landing on the enemy's coast is the capture of a secure base of operations, and that is usually considered in selecting the landing place. There will be no difficulty in making the landing itself, provided the enemy is taken by surprise, but it requires time to complete the unlading, and meanwhile the army must advance and requires a base of supplies. During the landing of the Japanese not an enemy came in sight, and yet it was twenty-four days before the last horse was ashore.

A preliminary reconnaissance of the place selected for landing would defeat the main purpose of the attack in this stage, namely, to take the defender by surprise. Such reconnaissance is only allowable as a feint.

Prompt landing is best assured by arranging the details of the order of unlading during the voyage, and then conducting the operation as systematically as possible. Each infantry division of 10,000 men should be given about one mile of coast room, and the ships should be anchored the proper distance apart for this purpose.

The advance-guard lands first, and at once throws up light earth-works, which are to be strengthened later on. The cavalry is next disembarked and sent out to make the earliest reconnaissance. The rest of the troops follow, then the trains, and lastly the supplies.

The time required for landing is much shorter than that for lading. The Russians in their manœuvres landed a division in 12 hours, the steamers having anchored 4 miles from shore. The French authorities allow, under average conditions, 6 hours for landing 25,000 infantry, 1,000 cavalry and 60 guns. The Japanese landed their Third army of 27,000 men, with provisions and horses, during very bad weather in about 36 hours.

The best protection for a coast is a powerful fleet, but if this fleet should be even temporarily defeated landings at once become possible. The unfortified coast regions between the fortified harbors should therefore be protected, and this is best effected by means of a special Coast Guard corps.

The distance between fortified harbors should not (for strategical and tactical reasons) exceed one day's cruise of the fleet,

or about 400 miles. Now the landing of the Japanese army shows that, under favorable conditions a fleet of transports can land about 25,000 men in 24 hours, consequently the defender should be able to concentrate that number in the same time. Hence, the unfortified stretch of 400 miles should be defended by about 30,000 men.

These troops are arranged like outposts along the coast with a central reserve in rear, the pickets being in communication with each other by signal or telegraph, and with the reserve by telephone or telegraph. To facilitate the movement of troops a railroad should be constructed about half a day's march from the coast, running parallel to it, and connecting the strategic points.

Patrol boats, or scouts, must guard the coast on the sea side.

Operations over sea in connection with wars on land are only useful as subordinate operations, or as final actions after the main blow has fallen. It is claimed, however, that the forces employed for such operations would be more useful in the main land army, but this is not necessarily so. For example, in 1870, four divisions had to be kept away from the main army to guard the coast of Germany; had the latter possessed a good fleet and gained the mastery in the North Sea, these troops landed on the north coast of France in the last stages of the war would have brought about its speedy close; and even in the earlier stages sudden irruptions on the coast, would have produced difficulties of supply of war material and provisions, which would have forced France continually to detach troops from her field army, and thus reduce her strength.

In conclusion, it may be interesting to study the probable character of the combined operations of a nation like Germany, for example, against one of two nations, differing so widely in their geographical conditions and their military relations.*

In a war between Germany and England, the policy of the former would probably be to gain temporary command of the sea, if possible, and then land her army in England as rapidly as possible, its first objective being the British army, its next in importance London, although it is more than probable that

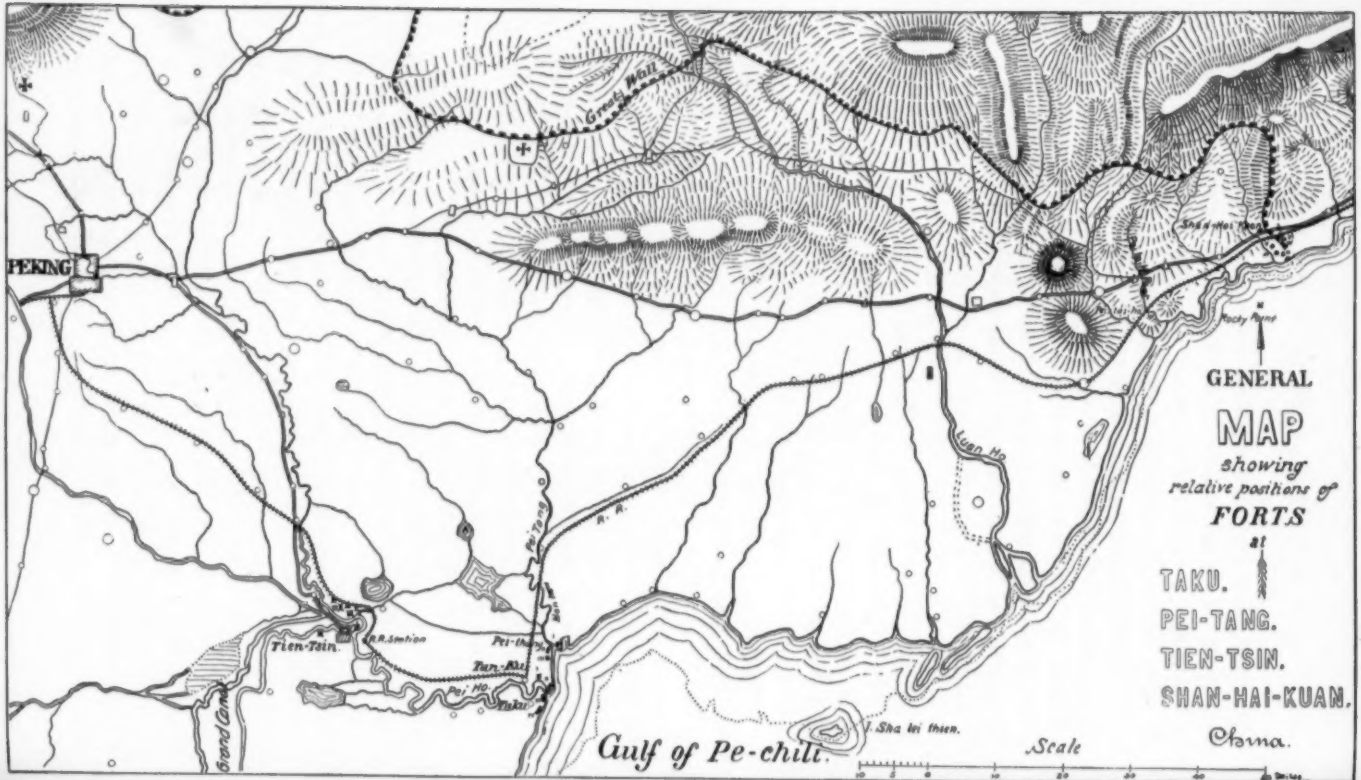
* Derived from a study of *Operationen ueber See*, von Edelsheim.

these two objectives will be united in one. Assuming that the 2 divisions of infantry and the cavalry brigade stationed in Ireland would have to be left there, England could oppose at first only her regular army, consisting of 6 divisions and 3 cavalry brigades, amounting to 60,000 infantry and 8,000 cavalry, so that Germany would be superior if she could land a greater number of troops promptly. As a matter of fact, she can land 80,000 infantry and 4,000 cavalry in about 30 hours on the English coast, and these troops could be supplied with material and subsisted for the time being in the country, and thus be independent of the fleet.

In a war between Germany and the United States, the course of the former would be entirely different. The German fleet would not first attempt to destroy the fleet of the United States, because success at sea for the former would not force the latter to make peace, consequently a combined operation would be attempted at the start. Invasion, of course, is out of the question, but the results of successful operations against the principal avenues of export and import on the Atlantic coast would probably prove decisive. The preparations for the transports and the landing forces would, therefore, begin immediately after the fighting fleet has been sent out, and in about four weeks the troops could begin operations on United States territory. These would probably consist merely in a series of landings, under the protection of the fleet, taking rapidly in succession the most important coast cities, capturing and destroying war and transportation material, and levying contributions. By feints and other deceptions the real point of attack can be kept secret till the operations at any particular point can be completed, or, if seriously opposed, the troops could be reëmbarked to appear again at some other point, and so on. The small size of the Regular army of the United States and the inadequate equipment and armament of the National Guard, may delay the concentration of a sufficient force till too late to accomplish much against a sudden attack.

The subject of combined operations has been sketched in outline. Many parts, briefly referred to here, such as convoy, lading and unlading, and the arrangement of transports are extensive studies in themselves, while others have been consid-

ered only in a very general way. The main features of such operations, however, and their importance to the world, as well as the grave questions of command and preparation have been brought out. The lessons to be learned and emphasized are *first*, the necessity for manœuvres to teach the best methods of lading and unlading, to insure concerted action without friction between the army and the navy, and to indicate the necessary preparations to be made in time of peace, and *secondly*, the need of a system of coast defense of the unfortified coast regions.



U.S. Engineer Office, China Relief Expedition, 1901.

SEA-COAST FORTS IN NORTH CHINA IN THE CAMPAIGN OF 1900.

By Captain W. E. CRAIGHILL, Corps of Engineers, U. S. A., (Late Major 40th Infantry, U. S. V.)

DURING the operations in North China in 1900, ending in the occupation of Pekin by the allied armies, three groups of sea-coast forts occupied a position of importance:

1st. The Taku Forts at the mouth of the Pei Ho;

2d. The forts at Pei Tang, at the mouth of the Hong Kow River, about 5 miles north of Taku; and

3d. The forts at Shan-Hai-Kwan, where the great wall ends at the sea.

The Taku Forts being at the mouth of the river, which was the water route to Tientsin and Pekin, and at the end of the railroad leading to the same cities, were of the first importance; and their capture was absolutely necessary as a preliminary to any movement in force looking toward the relief of the legations.

The Pei Tang Forts, being only about 4½ miles distant from Tong Ku, the base of supplies of the allied army, if occupied by a resolute and aggressive force, would have been an effectual bar to further advance along the railroad to Pekin because the terminus was under the fire of its heavy guns.

The Pei Tang Forts have an added interest in that it was here that the landing was made in 1860 as a preliminary to the attack upon the Taku Forts, and if the foreign ships had not been in the river before hostilities commenced, the same thing would probably have happened in 1900. The fact that the attack came from this direction in 1860 also probably had an influence in giving the strongest armament to the land fronts of the Taku Forts which looked northward toward Pei Tang; and the expectation of the attack from this direction, and the consequently comparatively small preparations on the side from

U.S. Engineer Office, China Relief Expedition, 1901.

which the attack did come in 1900, made the work comparatively easy.

During the night of the attack on the Taku Forts, the Pei Tang Forts were engaged in firing on the town of Tong Ku, and the fire was very effective. But after the first engagement, on account of the cowardice or inactivity of the garrison, they remained silent until taken by the Russians, a month or more after the fall of Pekin.

In the meantime the great business of the base, with its shipping and crowds of troops, was continually in the field of fire of the forts' heavy guns, but was not molested.

In addition to being the end of the line of railway to Pekin, Tong Ku is also the junction with the one running north along the coast towards Manchuria. When it was decided to open this road, it became necessary to take the Pei Tang Forts. The resistance being but nominal, the task was not a difficult one.

The forts at Shan-Hai-Kwan were important because the railroad running north, ultimately to connect with the Russian Trans-Siberian road, comes down at this point to the sea and breaks through the Chinese wall. Moreover, as the Taku anchorage becomes untenable on account of ice, if Pekin was to be held through the winter, it became necessary to find a place not closed by ice, from which the troops could be supplied and through which communication could be kept up with them. Shan-Hai-Kwan, about 130 miles north of Taku, was the place best adapted to this purpose. The forts at Shan-Hai-Kwan made no resistance, and were first occupied by a small landing party from a British man-of-war.

The following information as to the armament of the Pei Tang and Shan-Hai-Kwan forts, obtained from the office of the Chief Engineer of our forces, will be of interest in connection with the plans and pictures.

FORTS NEAR PEITANG.

Fort No. 1. (Occupied by Russians.)

Gun No. 1. Gun removed, emplacement similar to those for 15 cm. B. L. Krupp as No. 1 Fort No. III Shan-Hai-Kwan.

Gun No. 2. 15 cm. B. L. Krupp model of 1885, front pintle mount, 140° field of fire.

Gun No. 3. Same as No. 2 with 190° field of fire.

Gun No. 4. Same as No. 2 with 360° field of fire.

Fort No. 2. (Occupied by Russians.)

Guns Nos. 1 and 2. Guns removed, emplacements similar to those for 21 cm. B. L. Krupp, centre pintle mount as No. 1, Fort No. 1 Shan-Hai-Kwan.

Other guns are about 15 cm. Krupp, front pintle mounts.

Fort No. 3. (Occupied by Germans.)

Gun No. 5. Gun removed, emplacement similar to those for 8 inches Armstrong, centre pintle mount, as No. 3 Fort No. 3 Shan-Hai-Kwan (U. S. Naval Officer who saw this gun before it was dismounted judged it to be an 8-inch gun, it was an Armstrong). This gun is supposed to have fired the shot that struck the U. S. Ship Monocacy during the fight resulting in the capture of the Taku Forts, June, 1900.

The other guns were destroyed or removed from the remains and emplacements, they were judged to be about 6-inch B. L. Krupp, front pintle mount.

FORTS NEAR SHAN-HAI-KWAN.

Fort No. 1. (Occupied by British, French, Italian, Germans, Japanese, and Russians.)

Gun No. 1. 21 cm. B. L. Krupp model of 1893, centre pintle mount, 360° field of fire.

Gun No. 2. 21 cm. B. L. Krupp model of 1885, front pintle mount, 150° field of fire.

Gun No. 3. 12 cm. B. L. Krupp front pintle mount, 130° field of fire. Traverse circles rest on wooden crossties imbedded in the concrete.

Gun No. 4. Same as No. 2.

Gun No. 5. Same as No. 3.

Gun No. 6. Same as No. 1.

Gun No. 7. 18 cm. B. L. Krupp model of 1869, front pintle mount, 140° field of fire.

Gun No. 8. Same as No. 3.

Gun No. 9. Same as No. 3.

There are no magazines in this fort except small ones near the guns.

The concrete is about as tenacious as poor sandstone. It is made of old bricks and soft stone, held together by what is apparently lime mortar.

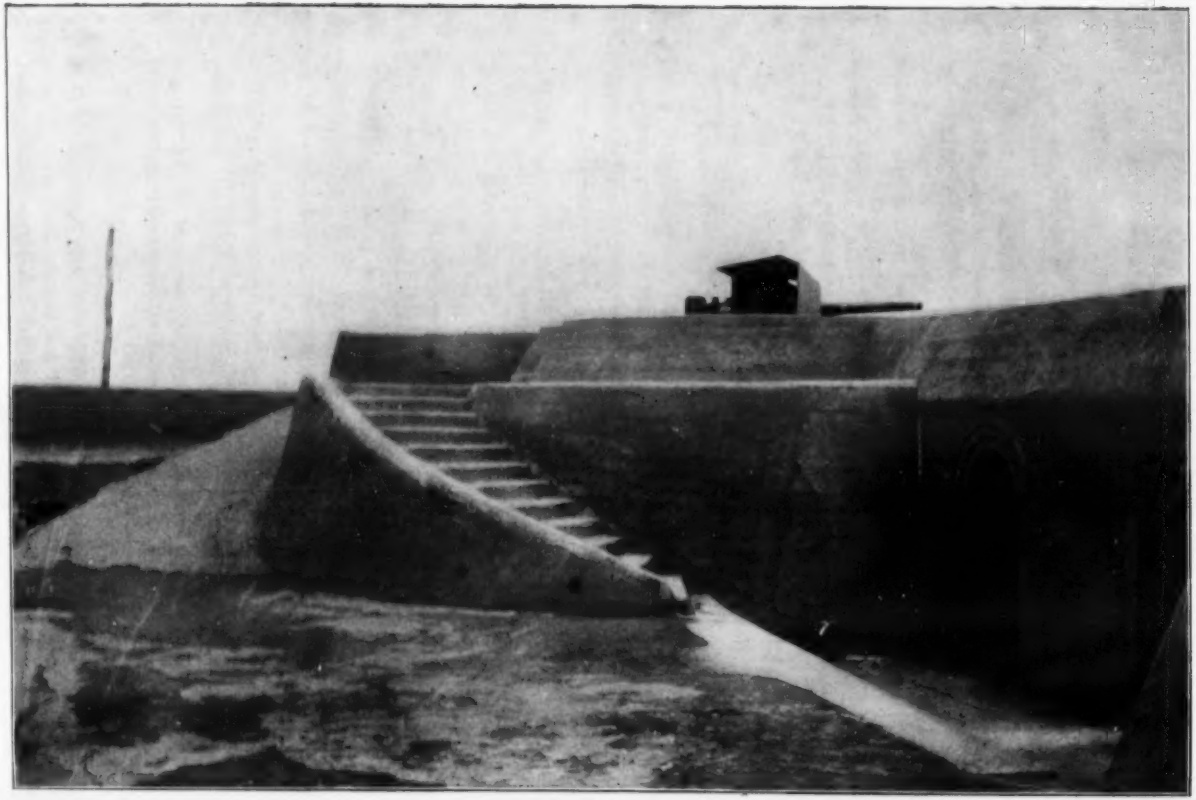
The wall around the enclosure on one side of the fort is of brick and is built with a parapet loopholed and crenelated like the city walls throughout the country.

Fort No. 2. (Occupied by Germans and Italians.)

Gun No. 1. 8-inch B. L. Armstrong with shield, model of 1894, centre pintle mount, 360° field of fire.

Gun No. 2. 15 cm. B. L. Krupp model of 1885, front pintle mount.

Gun No. 3. Same as No. 2.



FORT AT SHAN-HAI-KWAN
Showing one gun and steps.

Gun No. 4. Similar to No. 2, model 1867, wooden carriage.

Gun No. 5. Same as No. 1.

The magazines in this fort are well constructed and in good condition. They are 8′ x 12′ by 8′ high to crest of arch, being brick lined throughout. The lack of proper communication between guns No. 1 and 5 and their magazines is noticeable.

The concrete in this fort is of better quality than that in Fort No. 1.

Fort No. 3. (Occupied by French.)

Gun No. 1. 12 cm. B. L. Krupp with shield, model of 1895, centre pintle mount, 360° field of fire.

Gun No. 2. Same as No. 2, in Fort No. 2.

Gun No. 3. Same as No. 1, in Fort No. 2.

Gun No. 4. Same as No. 1, in Fort No. 2.

The magazines and concrete in this fort are similar to the same in Fort No. 2.

There were four 8 cm. field guns in this fort.

Fort No. 4. (Occupied by Russians.)

Guns No. 1 and No. 2. Same as No. 1 in Fort No. 3, 12 cm. B. L. Krupp with shield, etc.

Fort No. 5. (Occupied by British and Japanese.)

Guns No. 1, 2 and 3, about 12 cm. B. L. Krupp siege guns.

There were six 8 cm. field guns in this fort, one burst on trial by the British.

Fort No. 6. (Occupied by Russians.)

No guns were mounted in this fort which is similar to the other forts except it has no concrete facing.

The modern guns in these forts were distributed among the various powers having troops in the forts and preparations were being made to remove the guns.

These six "new forts" as they call those numbered above and the shelter trench were built in 1883 and 1884, under the direction of a German engineer, formerly an officer in the German army.

Besides these forts there are about 20 fortified enclosures between the Great Wall and the shelter trench to the east.

These are simply sets of barracks enclosed by a mud wall about 15 feet high, and 15 feet wide at the bottom, the slopes are about 1 on 5, and there is an infantry parapet about 4 feet high and 2 feet thick. These enclosures and walls are in various stages of decay and only 4 or 5 are in fairly good condition, but the roofs of all the houses are fallen in. It was said that when the word was received that the Chinese were to evacuate, their officers sold the timbers supporting the roofs, the window-frames, doors, etc., to the highest bidder in Shan-Hai-Kwan, for fire wood.

Fort "A" is the highest of these fortified enclosures. There is a tower about 200 feet high in this enclosure and this tower is

FORT AT SHAN-HAI-KWAN
Showing one gun and steps.

XUM

NORTH-EAST FORT, TAKU, CHINA (WEST FACE FROM SOUTH)
Occupied by Japanese, July 9, 1900—Japanese packhorses.

the last of the series of lookouts extending along the old road, now the railroad into Manchuria. These lookouts are about 8 miles apart and the alarm in case of threatened invasion of the Manchus was signaled by means of bonfires on these lookouts.

The Great Wall is said to have been begun here. It starts at the point of a well marked cape and follows the crest of a slight ridge, after it passes about 2 miles beyond Shan-Hai-Kwan, it follows a very rugged steep ridge and finally winds along the highest mountain crest, the first break being at Kalgan pass.

The following is a description of the battle at the Taku Forts as given by a British Naval officer in the pamphlet "From Portsmouth to Peking via Ladysmith":

The Taku Forts, which are considered among the finest of their description in the world, have played a prominent part in previous Chinese troubles with our country, and were now heavily armed with at least 120 guns, the greater number being of the most modern construction. It was in June, 1859, that Admiral Sir James Hope unsuccessfully attacked them with gunboats, but in August, 1860, a combined British and French force landed to the north of the river, and attacking them from their rear, carried one by assault, the remainder capitulating. On the present occasion the Allied Commanders sent an ultimatum to the Chinese Commander, on the 16th, demanding their unconditional surrender by 2 A. M., the 17th. In the event of a non-compliance, a combined attack by the Allies was arranged to take them by force.

The ordinary depth of water on the bar only permitting vessels of a draught of less than 12 feet to enter the river, the Allied Fleet, except gunboats and smaller craft, were compelled to lay at anchor quite twelve miles from the forts, and the ships therefore took no active part in the fight. The men-of-war in the river now consisted of H.M.S. Algerine, and the destroyers Whiting and Fame, besides seven other foreign vessels, viz., three Russians, one German, French, Japanese, and the American paddle-steamer Monocacy, which latter remained neutral during the battle, but otherwise rendered valuable Red Cross and other assistance, and also gave asylum to refugee foreigners on board.

The sudden departure of all Chinese employés on the railway and in other places, was an ominous sign that a negative reply was the most probable result of the ultimatum. Accordingly dispositions were made for the inevitable attack that must follow its refusal, and nearly 1,000 men from the Allied Fleet, except Americans, were sent into Taku on the afternoon of the 16th for assaulting and occupying the forts after being bombarded. The British portion numbered 320, and were under Commander Cradock (Alacrity), which officer was in supreme command of the allied shore forces during the attack that followed.

The Chinese reply was sent to the Algerine, fifty minutes after midnight on the 17th, in the shape of a heavy fire of shell directed at

NORTH-EAST FORT, TAKU, CHINA (WEST FACE FROM SOUTH)
Occupied by Japanese, July 9, 1900—Japanese packhorses.

her at close range from the Inner North Fort, followed immediately by a general bombardment between all the other forts and ships in the river.

The British and Russians, being in the Taku Reach, received the first part of the shell storm, but the other vessels were not long in taking up their positions and joining in this hastily brought about conflict, and by 2 A. M. the battle became general. The British and German ships now directed their fire principally on the northern forts, the others turning their attention to the southern. At the commencement of the battle, the British landing party was rapidly disembarked from the Algerine, and the Fame and Whiting immediately weighed and proceeded to carry out a prearranged plan for capturing four new Chinese destroyers moored alongside the Naval Yard. By a clever manœuvre the British destroyers successfully captured their Chinese sister ships, after a brief resistance, driving their crews overboard or below hatches, killing and wounding a few without suffering any casualties themselves. The moorings of the prizes were slipped, and with the assistance of two private tugs, they were towed up the river for safety, the Whiting being unfortunate enough whilst towing to get a five-inch shell into her hull, luckily escaping with little damage to herself, and none to her crew. This might be considered a splendid cheap capture, each prize being worth about £25,000, and had they been manned by determined crews, would have been an extreme source of danger to the Allied ships in the river, particularly so as it was dark. The battle was maintained almost without cessation throughout the night, and it is quite miraculous how these few small ships had survived till daylight the storm of shell that had been directed at them whilst lying at anchor. The inexperience of firing guns in the dark, and absence of training generally on the part of the Chinese, and the excellent shooting of the Allies, which helped to make the Chinese bad shooting still more erratic, no doubt explains the miracle.

Between 4 and 5 A. M., daylight broke, and the ships, with the exception of one Russian now partially disabled, got under weigh, and thus minimized the greater risk they would now run of being hit. The Chinese had apparently reserved much of their fire till daylight, as they now shelled the ships with greater vigor, and with more accuracy of aim. The situation had now become a very serious one for the Allies, as much of the enemy's fire had begun to tell, but its effect was considerably reduced as a large proportion of their shell failed to burst. Shortly before 5 A. M., a small magazine in the South Fort was blown up, which somewhat checked the Chinese fire. But it was only a temporary lull, as they soon recommenced with greater determination than ever, and their shells were also bursting more often; probably being better fused. The storming parties on shore were now getting into position for assaulting, a previous attempt having been made before daylight, but postponed for tactical reasons. Up till 6 A. M., the battle raged furiously on both

sides, two ships, the Russian that remained at anchor and the German, having both been badly damaged. The Russian had been hulled below the water-line, her machinery disabled, and had received a shell into one of her magazines, which latter had exploded and occasioned much damage to the ship and caused many casualties. The German had also been struck by a shell that had penetrated one of her boilers, causing several casualties, seriously wounding her gallant Captain. Notwithstanding these misfortunes of war, these two ships still fought what guns they could man throughout the battle, in such a style that elicited the admiration of their consorts.

By 7 A. M., the national flags of the Allies were flying from all the forts, which signalized the result of a battle that had been so magnificently fought and won. The victory was complete. The Chinese losses were estimated at one-third of the number engaged, which was not less than 3,000; many prisoners also being captured. The casualty list of the Allies in the ships were: H. M. S. Algerine, one officer and three men wounded; Russians, 16 killed, 47 wounded; Germans, 8 killed, 30 wounded; French, 1 killed, 1 wounded. Considering that the Algerine was leading ship, Captain Stewart being the senior naval officer present, and that she was struck by shell several times, her escape from more serious damage was a marvelous run of luck, as also was the case with the two destroyers.

The storming brigade was also very fortunate, its losses being small compared with the stupendous task it had had to perform; the assault of the Northwest Fort having been met with a vigorous resistance. The British loss was 1 killed, 9 wounded; the Russians suffered the heaviest, due to a temporary check at the outset of the attack; the German and Japanese losses were nearly equal, the latter losing their commander; the total casualties altogether were about 100. During the day the forts were put into a state of defense against any attempt at recapture, each nationality occupying a separate fort for an indefinite period.

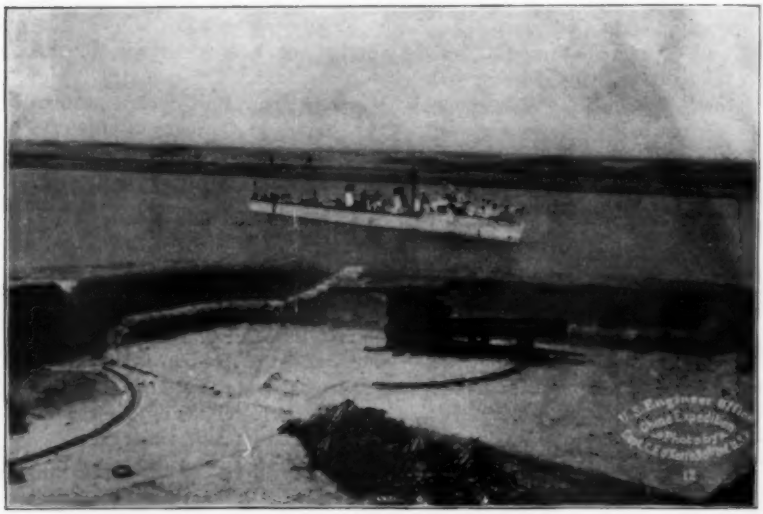
In November, 1900, I had an opportunity to visit the forts near Taku, the only ones under a serious fire. I made some observations then that may be of general interest.

At the time of my visit the guns and carriages, as well as the parapets and buildings, showed the effect of the fire of the Allied Fleet. They were occupied by troops representing the powers engaged in the attack, in some cases two or three nations being represented in the same fort.

The forts consisted of three principal works, all modern in their character; the north and south forts guarding the entrance to the river against attack from the sea, and the northwest fort, which was behind the other two and designed as a defense

against attack from the land side. The south fort, on the right side of the river's mouth, had some detached works armed with heavy sea-coast guns, and on its own sea front it had heavy guns. But as the water in front of it is too shallow for vessels of heavy draft to come within about ten miles, these guns could neither fire effectively on the ships nor could any heavy guns of the ships be brought near enough to reach the fort.

The northwest fort was in some respects the most interesting, as against it the attack was made, and after its fall, the



N. W. FORT, TAKU, CHINA—OCCUPIED BY BRITISH.
(Looking S. across the Peiho. Torpedo boat captured from Chinese by the British during the bombardment.)

other forts, with the aid of its guns, were quickly and easily taken. At the time of my visit, it was occupied by a British garrison, with a small detachment of Italians in one corner. It was a square, inclosed work, about a hundred and fifty yards on a side, surrounded by a covered way and a wet ditch, with the sally port on the river at the angle farthest downstream. It was connected with the north fort by a sunken roadway covered by a parapet on both sides. This probably played an important part in the defense, as it afforded the garrison a too ready and

secure means of retreat. The relief of the main *enceinte* was about 25 feet and of the covered way about 15 feet, the ditch between being narrow.

The parapet was about 20 feet thick, and was composed of the brown clay taken from the surrounding flats. There were no scarp or parade walls.

The surrounding country is barren mud flats, much cut up with pools and sloughs filled with water.

The fort was a strong one and well armed, but fatally defective in having no traverses. This last fact enabled the gunboats to enfilade the front upon which the attack of the landing party was directed, and was doubtless a controlling factor in promoting the success of the assault. The armament of the main work consisted of four 12 centimetre B. L. Krupp rifles, on pedestal mounts with shields. One was mounted in each angle of the fort. Three appeared to have been used in the fight, and one of these put itself out of action by tearing up its foundation which was defective.

The shields were prominent figures against the sky line. One was hit and pierced by a shell of about 5″ calibre. It also had some bullet marks upon it.

The covered way was armed with a number of muzzle loading Krupp rifles and some 8 and 15 centimetre breech loaders. On the front of attack (the one looking up the river), the armament of the covered way consisted of three 15 centimetre Krupp muzzle loaders mounted en barbette. This front was enfiladed by one of the gunboats which laid itself close alongside the fort in prolongation of the front attacked.

Around one of the guns in this front of the covered way, were found 47 dead Chinese, said to be successive gun detachments attempting to work the gun.

The landing party, consisting of about 900 men from the principal navies present, except the American, carried the work by assault. They are said to have been once driven back or stopped in their attack, but after the gunboats came in close, the Chinese retreated to the north fort, and the landing party entered by the gate. Between 400 and 500 Chinese are said to have been killed in the fort.

The ships engaged in the attack were all small, being gun-

XUM

TIENTSIN, 1901—8. FACE OF BLOCK PORT (FROM SOUTH).

boats or destroyers. They were the Barba (Russian), Algerine (British), Iltis (German), Goreetz (Russian), Leon (French) and Giliak (Russian). No large ships could get across the bar at the mouth of the river, as the depth is very little. The attacking fleet was all inside and above the forts before the engagement commenced.

The American ship Monocacy was in the river, but under orders from our Admiral not to take part in the action unless attacked, went up the river to what was supposed to be a place of safety. She, however, there found herself under a fire from the heaviest guns in action. No one knew where the fire was coming from, but it was probably from the forts at the mouth of the Peitang, the range being 4½ miles. One of these shells struck her, its angle of fall (about ⅙) showing the long range. Fortunately, as she was a wooden ship, the shell struck nothing hard enough to explode it, and passed out without doing much damage.

The north fort was held by the Japanese at the time of my visit. In general character, it resembled the south fort, except that it was smaller. Like the south fort, its sea-coast battery was of no value because of the shoal water in front. Lieut. Ferguson, Corps of Engineers, Chief Engineer of our Relief Expedition, stated to me that its armament consisted of

Two 4″ Krupp,
One 6″ Armstrong,
all mounted en barbette with shields, on centre pintle carriages;
Two 6″ Krupp guns, model 84,
Two 6″ Krupp " model 65,
One 6″ Krupp gun, model 77,
Three muzzle loading rifles.

This fort was easily occupied after the capture of the northwest fort and did not present features of much interest.

The south fort, on the right bank of the river, was garrisoned at the time of my visit, by the Russians and Germans, and a small detachment of French. After the northwest and north forts were occupied, their guns were turned upon the south fort, in conjunction with the fire of the fleet.

The south fort is a large one, the gorge being inclosed, and defended by a large outwork in which was the Chinese torpedo

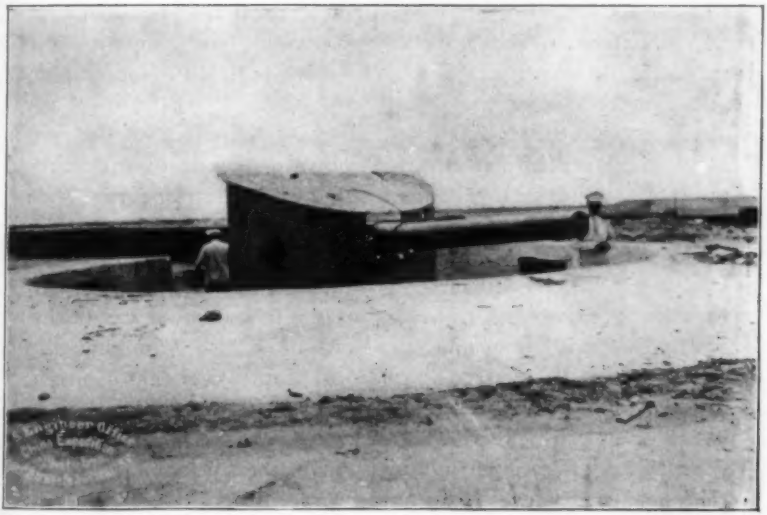
TIENTSIN, 1901—6. FACE OF BLOCK FORT (FROM SOUTH).

OLD SOUTH FORT, TAKU, CHINA, JULY 8, 1900
(In North end—looking N. W.)

station. On the sea front, the most prominent feature was three high cavaliers, with emplacements for two guns each, their parapets being about forty feet above sea level. These emplacements were almost identical in their design, arrangement of platform, etc., with our 6″ emplacements. The concrete was, however, of a very poor quality. The guns were Armstrong B. L. rifles, about 7″ calibre, mounted en barbette on Armstrong carriages, with shields. There was also in the angle of the fort looking towards the north fort a 15 centimetre Krupp B. L. rifle, similarly mounted. On the parapets in the north half of the fort, there were besides 25 modern B. L. rifles and 20 M. L. rifles.

The guns in the high emplacements, with their conspicuous shields, suffered the most damage. The shields were generally struck and pierced several times, and the marks of the fragments were very evident on the guns. The carriages in several cases were disabled by some of the traversing or elevating gear being broken by fragments of shells. Doubtless the casualties to the gun detachments were numerous in these cases. In one instance only was the gun itself disabled by a shot striking it near the muzzle and knocking it out of the cradle. The

OLD SOUTH FORT, TAKU, CHINA, JULY 8, 1900.
(North Mound—looking South.)



OLD SOUTH FORT, TAKU, CHINA, JULY 8, 1900.
(Occupied by Russians—North gun, disabled by shot thro' recoil mechanism.)

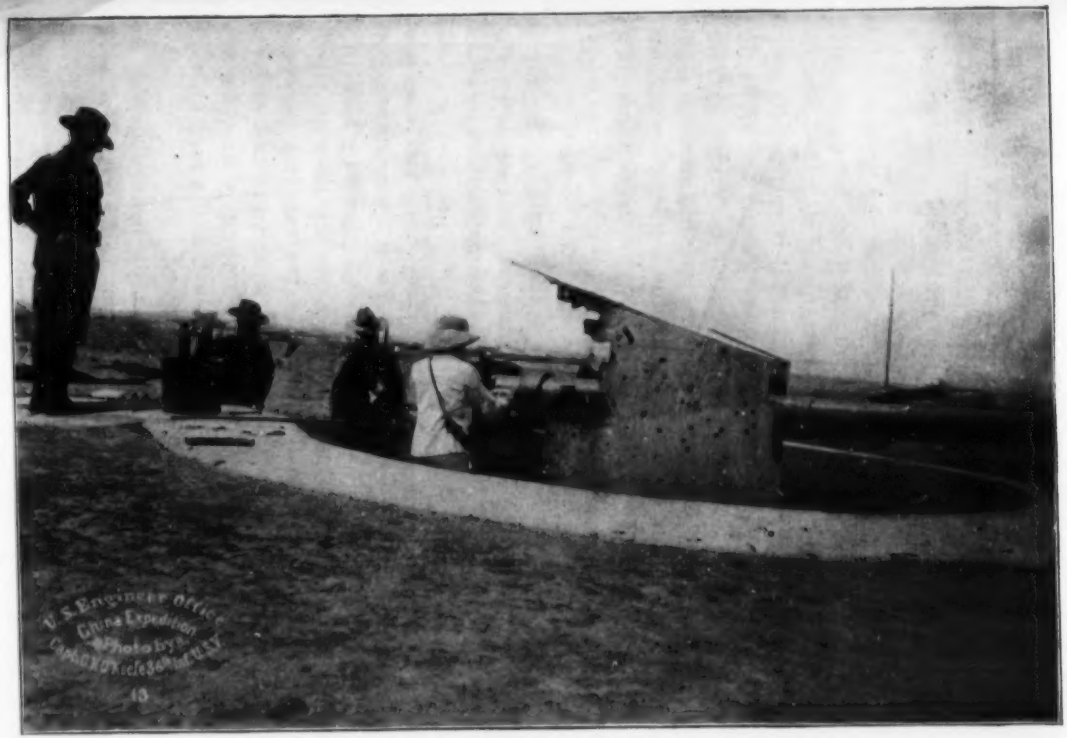
parapets were hit a number of times, but the damage was trifling. The gun on the northwest salient (overlooking the river) was hit five times by shells, twice on top of the shield, twice on the front, once on the gun itself, by a shot which came through the slot in the shield. There were also marks of fragments on the shield, the shells having struck the top of the parapet in front and burst. Of the two guns in the north high emplacement, one was put out of action by a shell penetrating its shield, and the fragments striking the top carriage. Its shield was penetrated twice. The shield of the other gun was hit once. Of the guns in the central high emplacement, the shield of one was hit.

Close to this battery and slightly in rear of it, there was a large magazine, which was exploded by a shell, probably from the northwest fort. The explosion did not apparently damage the gun emplacements materially, but wrecked the quarters and other buildings in its vicinity.

No damage was done to the south half of the fort.

The fort was not vigorously defended and was occupied by the Russians after it was evacuated by the Chinese. The Russians entered by the gate nearest the river, at the north end of the land front. This gate had no flanking arrangements, but was defended by a Gatling and a four-barreled Nordenfeldt gun mounted above it.

After examining the forts and seeing the effects of the fire, I was strongly impressed with the value of our disappearing mounts, including the balance pillar mounting for rapid-fire guns of small calibre. One gun of this character, mounted on the northwest fort, might easily have changed the result of the attack. When it is remembered that the ship that was enfilading the front of attack was a small one and could have been easily disabled by one shot, and that she was so close that she could hardly be missed, no one could fail to feel that a single gun that could be loaded under cover would have been able to get in one or two effective shots and change the fortunes of the day. The landing party, which made their attack entirely in the open, over a level plain, under circumstances of great difficulty, if denied the cover of the fire of the fleet, would have had an almost hopeless task.



TAKU FORT—EFFECT OF FIRE ON GUN-SHIELD.

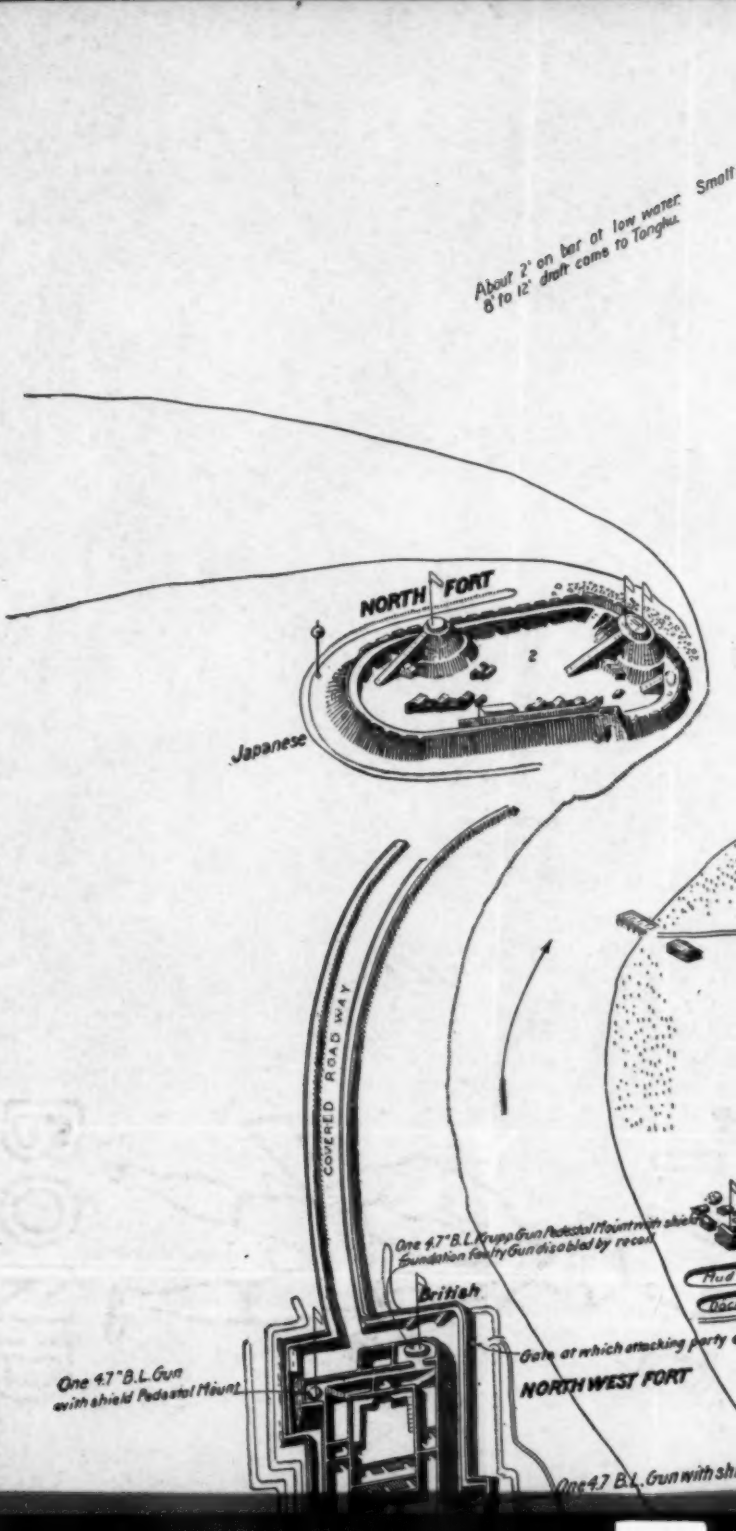
The 47 dead Chinese lying around the gun in the covered way of the northwest fort were witnesses to the inefficiency of the barbette mount under modern conditions. Their gun was a muzzle loader, it is true, but their fate would have been the same if they had been standing on the loading platform of a breech-loader. The damage to the gear of the top carriages of the breech-loaders points to the same conclusion. The top carriage of a barbette mount must be above the parapet at all times, and the gearing, wheels, etc., required for manœuvring the gun are easily broken by the fragments of a shell, and this happened in many instances at Taku. It is particularly apt to happen if a shield is put on the gun to burst the shells that strike it. This is the office the shields performed at Taku. They showed but few marks of bullets and fragments of shells. Besides presenting an excellent target to aim at, they undoubtedly were a positive detriment to the gun and detachment by serving to catch and burst shells that might otherwise have passed harmlessly by. More than this, the barbette guns are necessarily so plainly visible, that without entering the forts it was easily possible to pick out the guns and their emplacements, and guess closely at their size, and make preparations for attack accordingly.

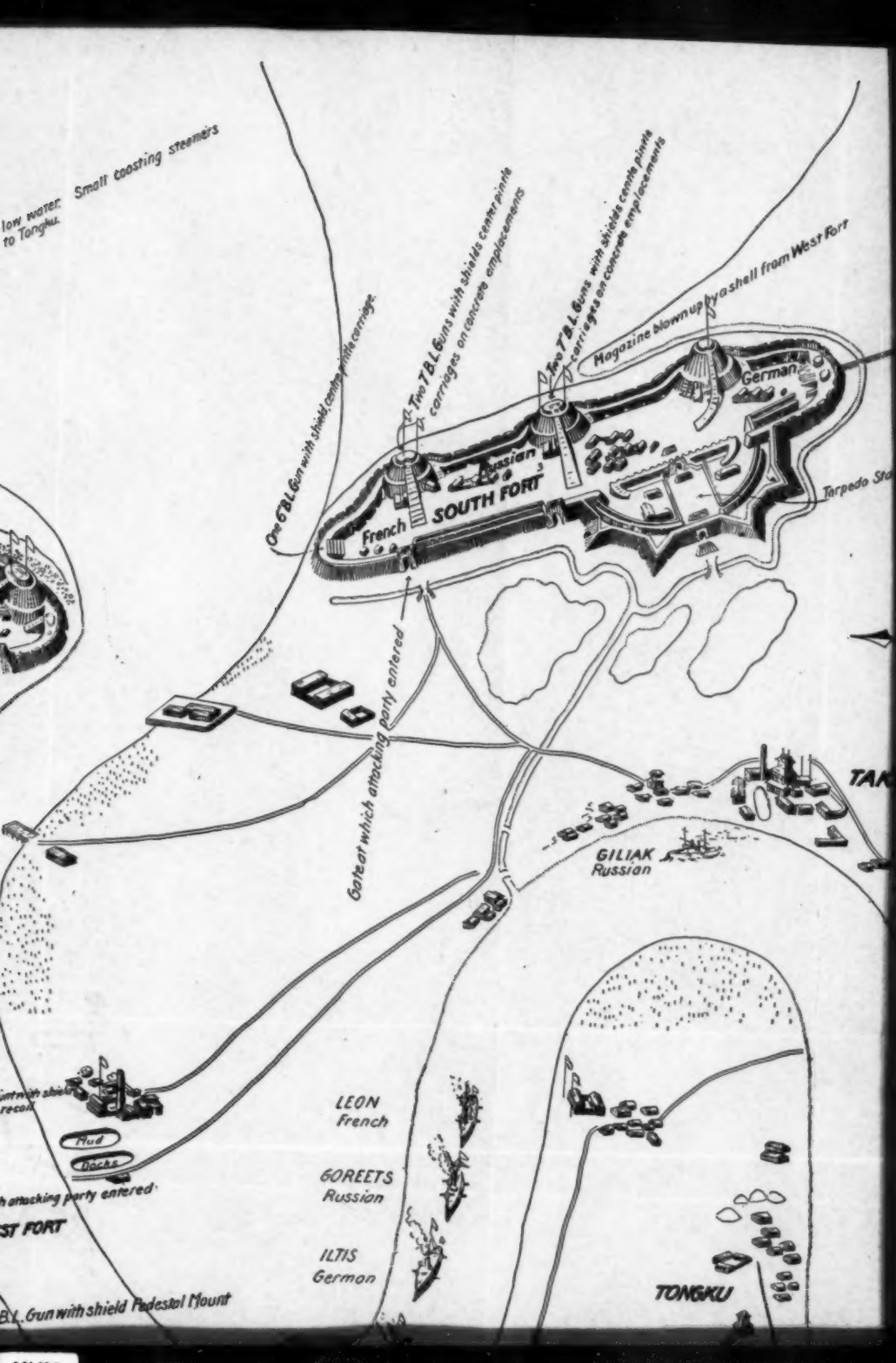
The same idea was apparent at Hong Kong and in some of the ports of Japan which I visited. From a ship entering the harbors, the batteries mounting guns en barbette are easily distinguishable by their guns. When there are no guns visible over the parapet, as should always be the case in a disappearing battery, except when the guns are in use, it is impossible to tell from a ship in the harbor whether the object in view is a battery or not, or whether armed or not, or if armed what are the number and character of its armament.

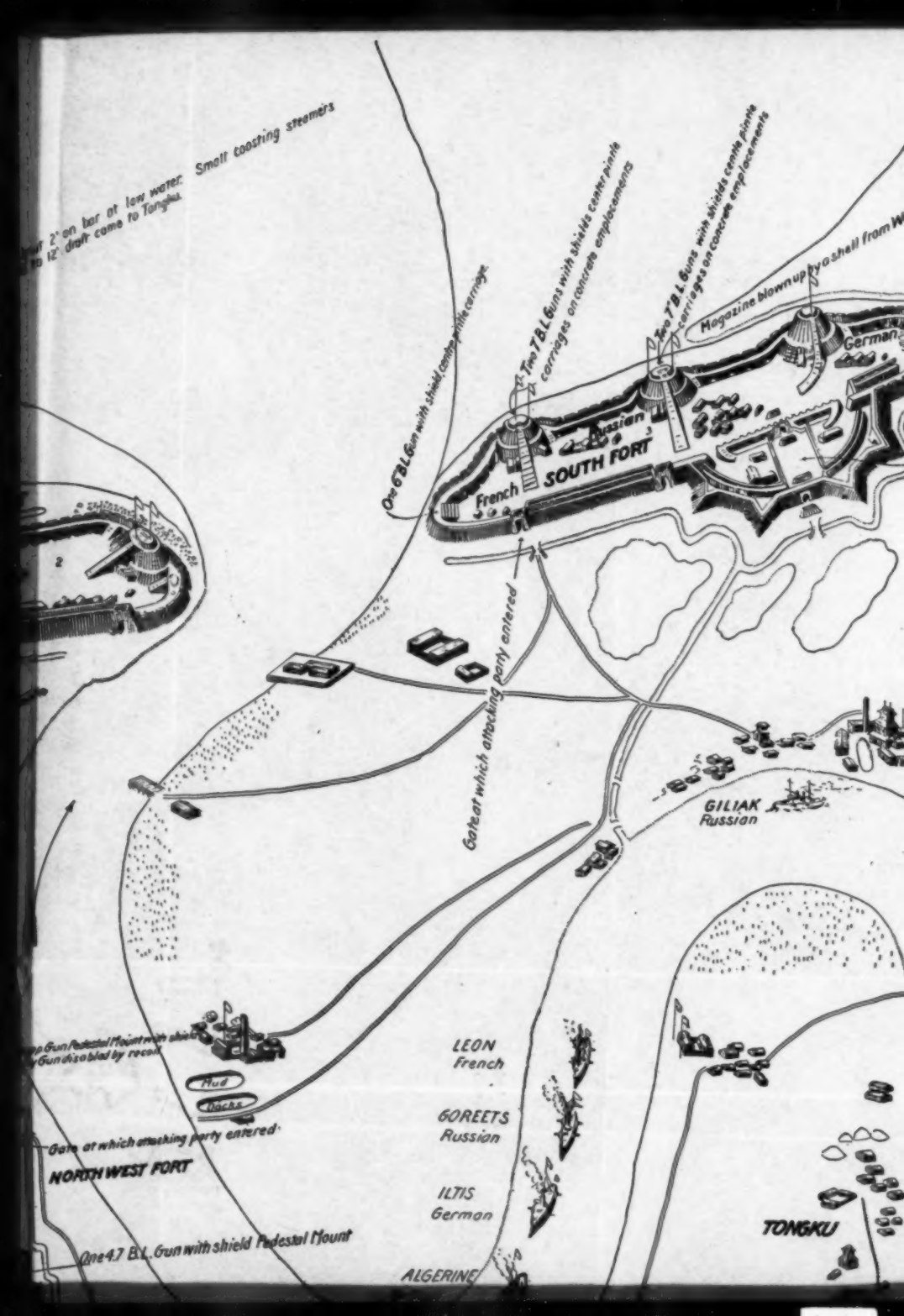
Especially, guns with shields are easily distinguishable. No one who has been opposed to an enemy using smokeless powder, can fail to appreciate the immense disadvantage to an attacking force from the resulting uncertainty on its part as to exact location and character of its enemy's position.

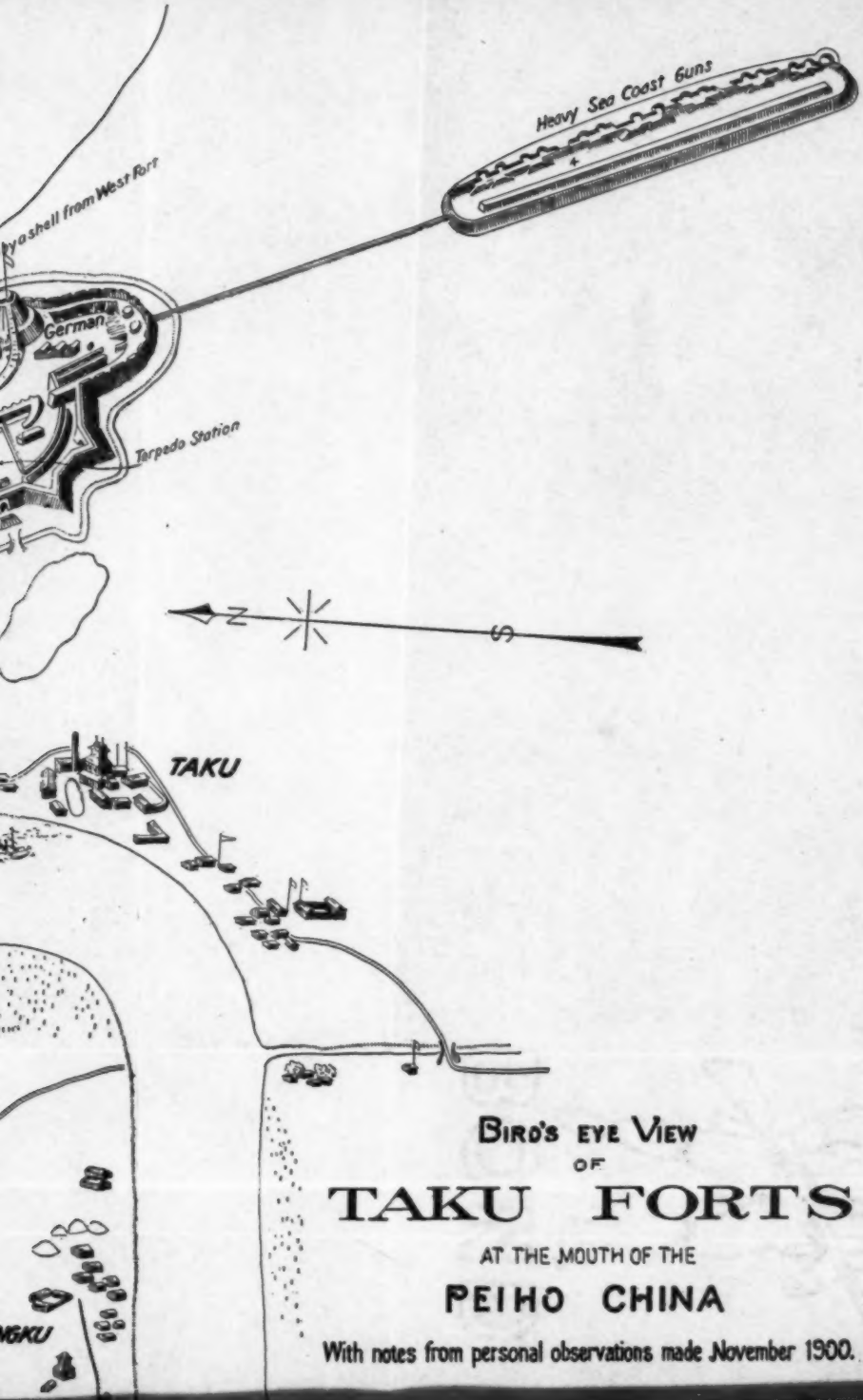
While the forts in China were, with their armament, very strong, possibly good enough for most emergencies, yet they lacked some of the merits in design and armament that might

XUM


About 2' on bar at low water. Small
6 to 12' draft come to Tonghu.
NORTH FORT
Japanese
COVERED ROAD WAY
British
One 4.7" B.L. Gun
with shield Pedestal Mount
NORTH WEST FORT


low water
to Tonghu
Small coasting steamers
One 6 B.L. Gun with shield centre pintle carriage
Two 7 B.L. Guns with shields centre pintle carriages on concrete emplacements
Two 7 B.L. Guns with shields centre pintle carriages on concrete emplacements
Magazine blown up by a shell from West Fort
German
Russian
French
SOUTH FORT
Torpedo Sta
Gate at which attacking party entered
GILIAK
Russian
LEON
French
GOREETS
Russian
ILTIS
German
TONGKU
Mud
Docks
ST FORT
B.L. Gun with shield Pedestal Mount


Small coasting steamers
2' on bar at low water.
to 12' draft come to Tongku.
One 6 B.L. Gun with shield centre pintle carriage
Two 7 B.L. Guns with shields centre pivots carriages on concrete emplacements
Two 7 B.L. Guns with shields centre pivots carriages on concrete emplacements
Magazine blown up by a shell from W
German
Russian
French
SOUTH FORT
Gate at which attacking party entered
GILIAK
Russian
LEON
French
GOREETS
Russian
ILTIS
German
ALGERINE
Mud
Rocks
Gate at which attacking party entered
NORTH WEST FORT
One 4.7 B.L. Gun with shield Pedestal Mount
TONGKU



BIRD'S EYE VIEW

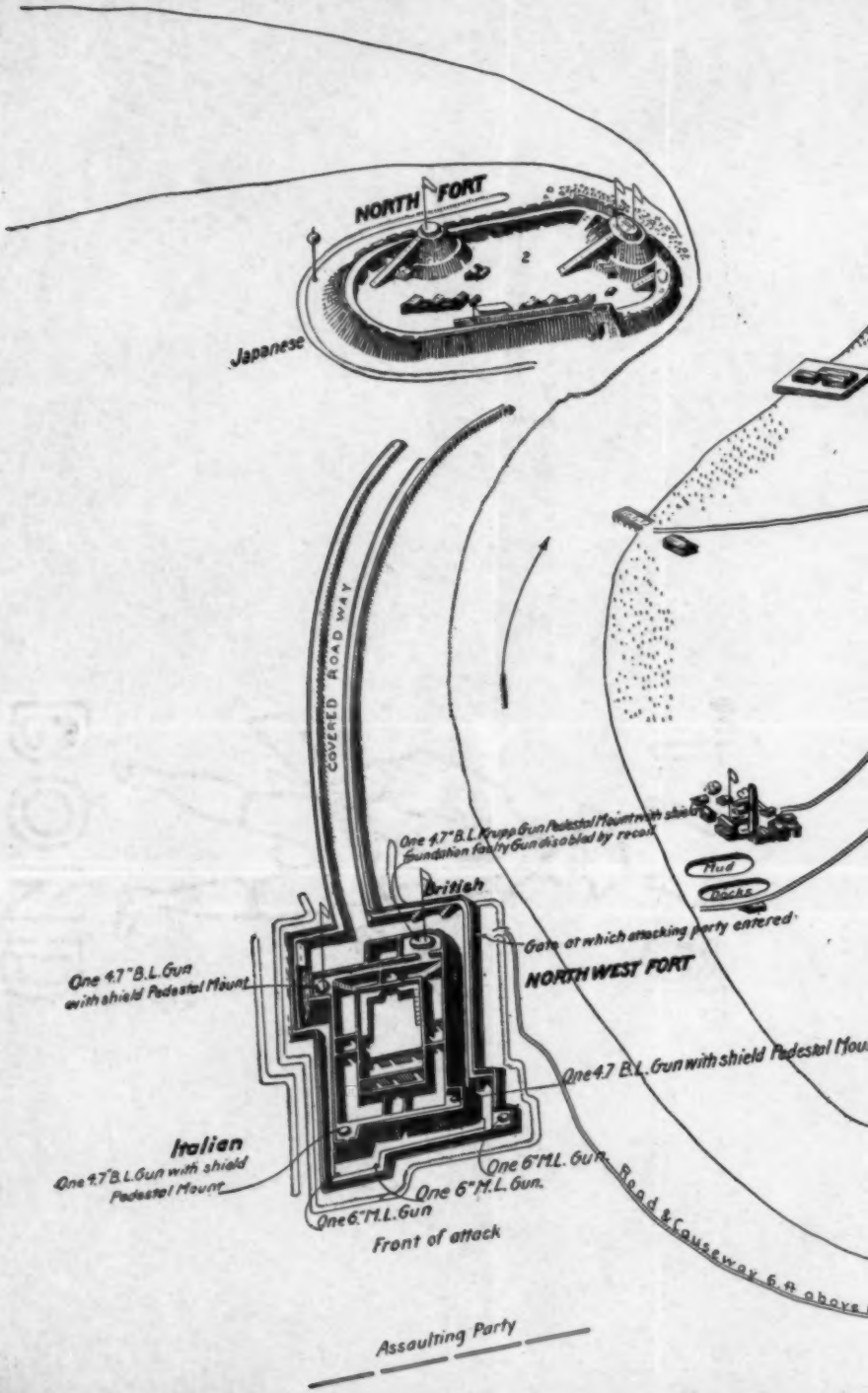
OF

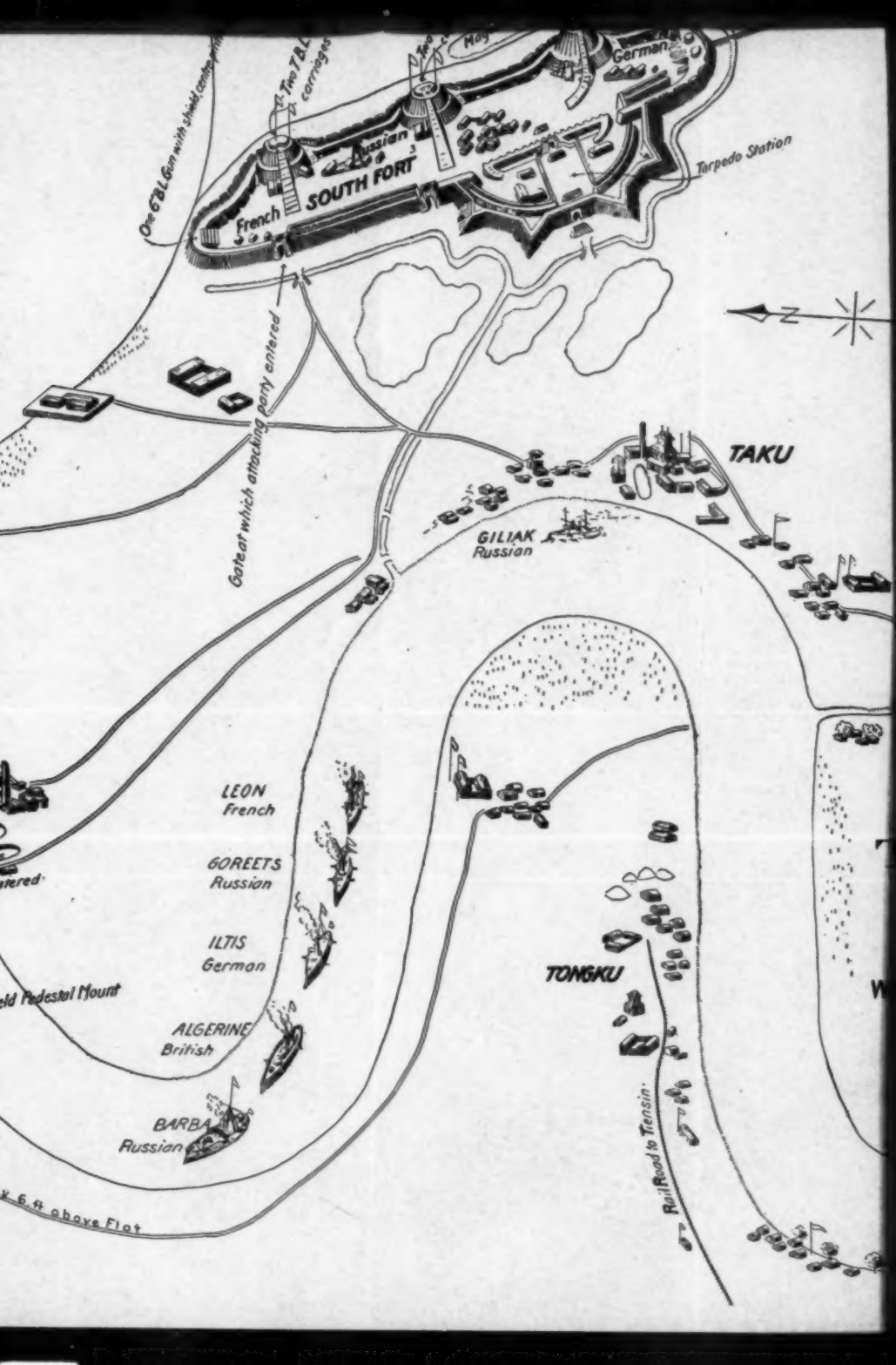
TAKU FORTS

AT THE MOUTH OF THE

PEIHO CHINA

With notes from personal observations made November 1900.


NORTH FORT
Japanese
COVERED ROAD WAY
British
Gate at which attacking party entered
NORTH WEST FORT
One 4.7" B.L. Gun with shield Pedestal Mount
Italian
One 4.7" B.L. Gun with shield Pedestal Mount
One 6" M.L. Gun
One 6" M.L. Gun
One 6" M.L. Gun
Front of attack
Mud
Rocks
Assaulting Party


German
Russian
French
SOUTH FORT
Torpedo Station
TAKU
GILIAK
Russian
Gateat which attacking party entered
LEON
French
GOREETS
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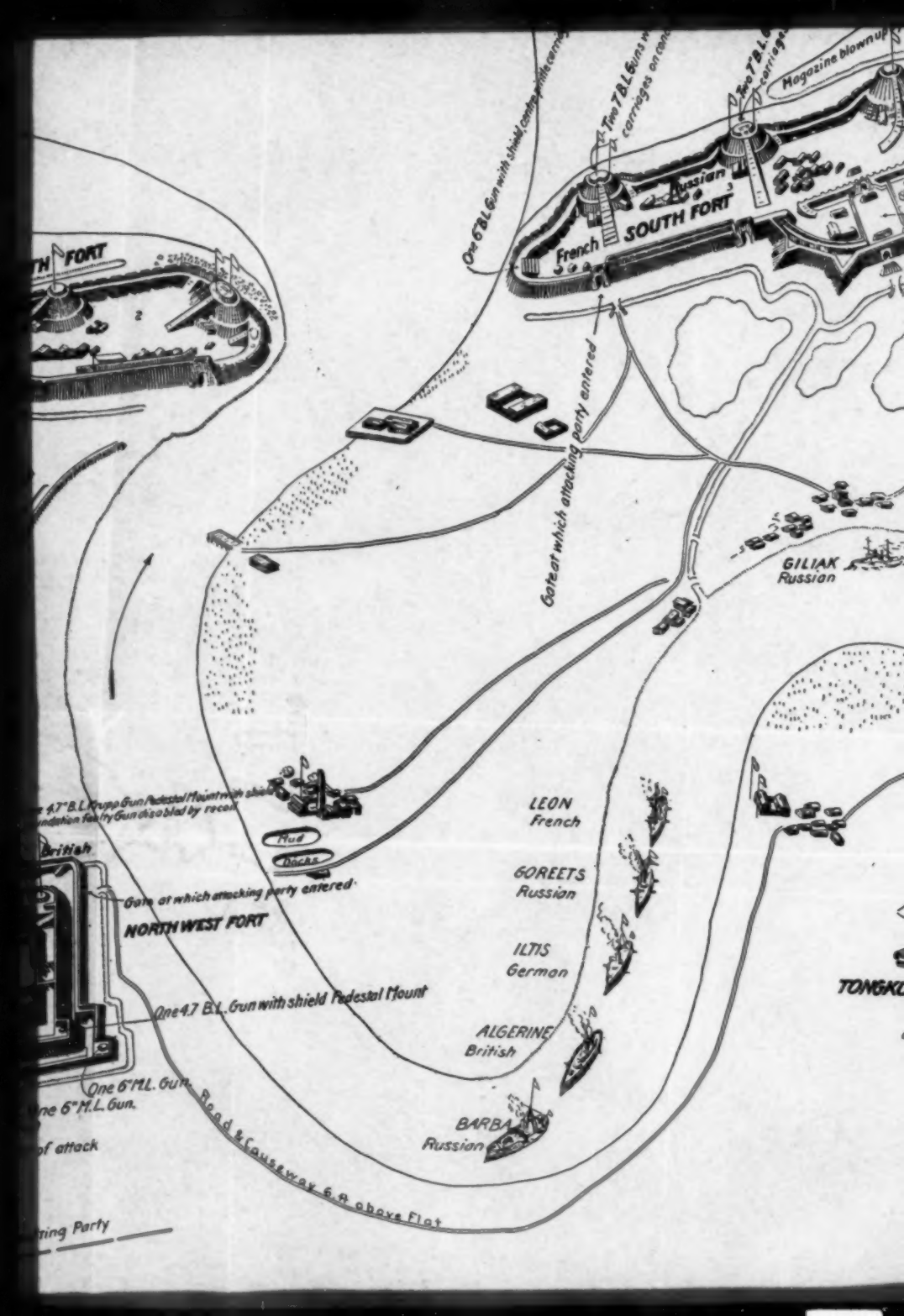
ILTIS
German
TONGKU
ALGERINE
British
BARBA
Russian
Rail Road to Tiensin


SOUTH FORT
French
Russian
Two 7 B.L. Guns
carriages on
Magazine blown up
One 6 B.L. Gun with shield, centre pintle
Gate at which attacking party entered
GILIAK
Russian
LEON
French
GOREETS
Russian
ILTIS
German
ALGERINE
British
BARBA
Russian
Mud
Docks
British
NORTH WEST FORT
Gate at which attacking party entered
One 4.7 B.L. Gun with shield Pedestal Mount
One 6" M.L. Gun
Road & Causeway 6 ft above Flat

BIRD'S EYE VIEW
OF
TAKU FORTS
AT THE MOUTH OF THE
PEIHO CHINA

With notes from personal observations made November 1900.

W. E. Craighill
Captain Corps of Engineers U.S.A.

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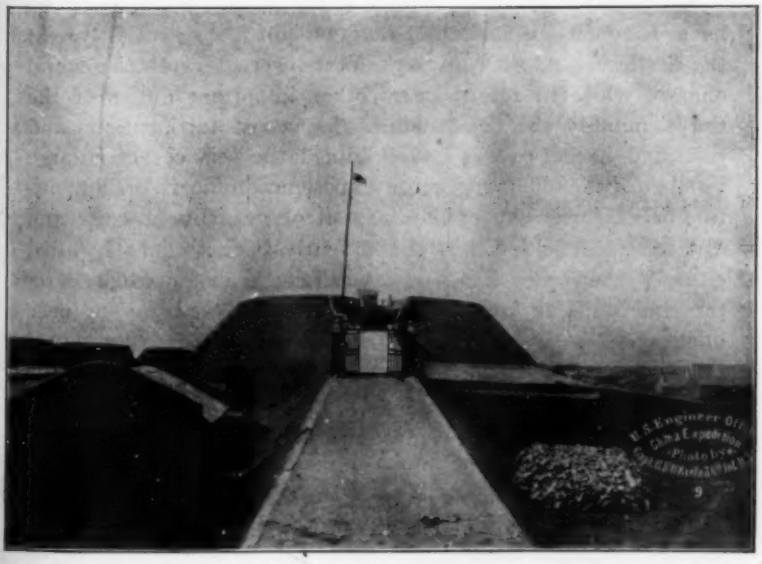
have been given them with a little more skill and money, and the thought is firmly fixed in the mind of one who has seen the results of the armies of civilized Europe and America invading China, that we will be but unfaithful servants, unworthy of the trust imposed in us, if we allow any considerations of cost of dollars and cents to enter into the question of providing for our country every reasonable protection that the nation's abundant wealth can secure, to prevent even the smallest chance of such a host ever invading our shores. Economy of construction must, of course, be considered, but the defenses must be made to include the most perfect possible devices, without regard to cost.

It should not be forgotten that the stay of an army of invasion on our shores for one week might easily cause more loss in money and treasure than the whole cost of the most complete system of defenses for all our seaports, without considering the things upon which no money value can be placed, the humiliation of being subject to the power of a foreign army, the insults to our men and the terrors and sufferings that our women must endure.



N. E. FORT, TAKU, CHINA—N. GUN FROM NORTH.
(Occupied by Japanese, July 9, 1900.)

MILITARY ENGINEERING IN THE NATIONAL GUARD.

By Captain EDGAR JADWIN, Corps of Engineers, U. S. A., Late Major 1st. U. S. Vol. Engrs.

FOR the military engineering of a large organization, as a Corps or Division, there are required:

An engineer officer on the staff of the Commanding General,

A command of engineer troops,

General instruction of all line troops in the elementary engineering essentials, and

Provision for a supply of tools and materials.

The system used by the National Guard should naturally correspond, as nearly as practicable, with that in the United States Army.

In the Regular army, officers of the Corps of Engineers, so far as they may be available, are detailed for the staff duty. In the Civil War many engineer officers were serving as general officers, while in recent years other important duties of the Corps, notably the construction of sea-coast fortifications and river and harbor work, have claimed the services of a large number of the older and more experienced officers. The position of Engineer Officer on the staff of department, corps and division commanders has consequently been frequently filled either by engineer officers of lower rank than other officers on the same staffs, or by line officers assigned as acting engineer officers.

During the Spanish-American War, Congress provided for the Volunteer organization a chief engineer with the rank of lieut. colonel, on the staff of each corps commander, and an engineer officer with the rank of major, on the staff of each division commander.

The duties of Chief Engineer in the field comprise general supervision under the direction of the Commanding General, of

map, road, bridge, dock, fortification, siege, mining and similar work.

The engineer troops of the Regular army consist of three battalions of engineers. One is in the Philippines; another just returned from there is at Fort Leavenworth, Kansas, while the headquarters of the other have recently been transferred from Fort Totten, Willett's Point, N. Y., to Washington Barracks. Detachments of this battalion are now on duty in various points of the United States and Alaska. At the beginning of the Spanish War there was but one battalion. Two of its companies were sent with the Santiago expedition, one with the first Philippine expedition, and one was broken up into small detachments which were assigned to the principal harbors of the United States to assist in planting and operating the submarine mines. A detachment from the battalion then in the Philippines formed part of the allied troops in the Chinese campaign.

During the Civil War special construction corps were organized. This is also done in foreign armies, companies being organized specially for railroad or balloon work.

The battalions are officered by detail from the Corps of Engineers. Many of the enlisted men are mechanics. Unfortunately the pay and allowances, while better than for infantry, cavalry and artillery, are not sufficient to fill the battalions with such men.

The troops are armed and equipped as infantry. At the headquarters of the home battalion a thorough system of instruction is in force to fit the troops for their special duties. In this work use is made of the U. S. Engineer service manuals for the subjects which they cover. These are supplemented by the manuals of other services. One of the best of the latter is the Chatham Manual, which embodies the course of instruction at the School of Military Engineering, Chatham, England.

The regular engineer troops have been intrusted with many important duties which have been performed with manifest benefit to the service.

During the Spanish-American War, Congress provided for three regiments of Volunteer Engineers. These regiments were commanded by officers from the Corps of Engineers of the Regular army. Many of their field officers were appointed from

the regular service with increased volunteer rank. The company officers were, as a rule, civil engineers. The enlisted men were largely mechanics. The regiments were provided with an engineer train in addition to being armed and equipped as infantry. As a rule they were assigned directly to the Headquarters of the District, Corps, Division or Brigade, with which they were on duty. Their services were most frequently by battalion, although at times some of them were held together for several months continuous service, while at times they were so broken up for long periods as to perform almost individual service.

They served in Cuba, Porto Rico and Hawaii and were extremely useful on account of their resourcefulness and adaptability. Generally their instruction in the service was confined to the development of the organization and to infantry work. Some instruction was had in the elements of field military engineering, but on the whole it was found that they had little difficulty in dealing with such engineering problems as were encountered.

The percentage of engineer troops required in a command varies with the engineer work to be done and with the part done by other troops. In some foreign armies it runs high—5 per cent. and over.

The general tendency in engineering matters as in many others in the U. S. Army is to have the infantry, artillery and cavalry instructed in such matters as may have to be done immediately and at any place to effect the success of their operations. Much has been done to advance this work at the Infantry and Cavalry School at Fort Leavenworth, Kansas, where an excellent handbook for the purpose has been developed, Beach's Manual of Military Engineering.

All troops have to make their own road reconnoissance. In the Civil War they threw up their own hasty entrenchments. As they are taught to use the rifle, so they learn its range, effect and penetration. They learn how to take advantage of the various kinds of cover, and should learn how to improve that cover when necessary. They have charge of their own field transportation, and should have elementary instruction in the construction of roads and simple bridges. Many regiments in the Civil War had their own pioneer companies, used

largely for this work and for clearing ground. In camp, troops learn how to make the simple constructions necessary for their health and comfort. The field artillery are taught to make their own gun pits.

The more technical engineer work, can be performed to the best advantage by engineer troops, who should be *par excellence* mechanics. The supervision of siege operations, the construction of bridges, magazines, the making of maps, siege works and other similar matters, come more especially within their province.

If a position has to be quickly and strongly entrenched, all troops may for a time have to assist, and it is hardly to be expected that the normal engineer force will be more than large enough to supervise the work. If the work consists simply of the construction of a few magazines or of map work, it may all be done by the Engineers.

It is difficult to foresee the exact amount of this class of work that will be needed. Much of it may not be needed in time of battle. On the other hand, other troops may not be available for guard at all times when there is engineer work to be done. For these reasons the engineer troops are equipped for infantry operations. A portion of them are now being mounted in order that less time and energy may be required for transportation and more be available for work.

The line troops carry with them, as a rule, few tools outside of a very limited number of shovels, picks and axes.

The engineer troops in the field are usually provided with an engineer train, which includes the tools and materials most likely to be needed in an emergency and for a large variety of work ; for example, blocks and falls, saws and lanterns, sledges, crows, picks, shovels, axes, etc. During the Civil War there was much crossing of wide and deep streams and each large army had its own pontoon train. During the Spanish-American War about six wagon loads of engineer tools and materials were provided for each volunteer battalion of four companies.

There was also provision for a large supply of picks, shovels, etc., for use in case siege operations had been undertaken.

It is, substantially, along these same lines that military engineering should be applied in the National Guard.

To be more specific,—take the case of a brigade liable to do service independently. There should be a brigade engineer officer; a command of engineer troops—not less than one company—; instruction of all troops in certain engineering essentials; and provision for such tools and materials as may be needed.

The brigade engineer officer should have the same rank as the assistant adjutant general. He should keep in touch with the commanding general; be on the lookout for the engineering necessities of the various organizations, and exercise a general supervision over the engineer troops of the command. He should be informed on the elements of the engineering problems most likely to occur, and be prepared to make proper recommendations.

For example, he should be prepared to co-operate with the commanding officer of a regiment in the instruction of his troops in the construction of entrenchments. In the drill at camp he would indicate the best line to be selected for defense under given conditions of attack, and, if they can be spared, arrange for a detail of the engineer troops to lay out the line on the ground and at intervals construct small sections of breastwork which shall serve as samples. He should also indicate how the men should be spaced for the work, etc.

In general, so far as the instruction of infantry troops in engineering duties is concerned, his position should be that of an expert. The commanding officer of the troops should be responsible for the quantity and quality of the work done.

He should be familiar with elements relating to the laying out of camps for the various organizations, and be prepared to advise as to the constructions and expedients desirable for the comfort and health of the command. He can obtain many suggestions from the published manuals of military engineering.

In case of riot duty, an attempt is always made to introduce troops into the disaffected districts in such overwhelming force that defensive constructions are not necessary for the troops. Still it may be necessary occasionally to place a building or the streets leading to it in defensive condition. The Chief Engineer should be prepared to advise to what extent this shall be done, how it can be done with the least injury to the property, and,

if practicable, send a small detachment of engineer troops to lead in the work of preparing obstacles by overturning wagons and throwing up barricades, cutting loopholes, making connections for a large stream of water offensively or defensively, and extemporizing ladders to enable the troops to reach commanding positions on buildings.

At the battle of Monterey, Mexico, the Mexicans had the main streets so well enfiladed by the fire of their troops behind barricades in the streets and parapets on the roofs of their low buildings, that one division of the attacking American army made the best progress by cutting through the walls of houses with picks and crows. In such an operation to-day, explosives would undoubtedly be utilized. The Chief Engineer should be prepared to advise as to the size of charges and most practicable methods of placing and firing them.

It is evident from the above examples that the Chief Engineer should be a man of experience and capacity. The position can probably best be filled by the appointment of a successful civil engineer of wide experience both in engineering and in the control of men.

The engineer company should be composed, so far as practicable, of men who know their engineering specialties in civil life, and who have only to learn the military application.

It is possible that with the relatively limited time that can be spared for drill and instruction in the National Guard, it would be feasible to develop satisfactory engineer troops out of men with no engineering experience. Fortunately it is not necessary to rely on doing this, as there are so many men who already know engineering or some branch of it. In general as good a soldier can be developed out of a civil engineer as from a lawyer or business man. In fact, construction engineers and contractors have a certain advantage in that they are accustomed both to the exercise of discipline out of doors, and to dealing with contingencies requiring the exercise of much resource.

This company, while under the general supervision of the Chief Engineer in professional matters, may with advantage make its administrative reports direct to the Adjutant-General. It should form a part of the line of the Guard as the battalions

of engineers form a part of the line of the Army. This will better enable the troops to appreciate the military side of their professional work, and at the same time enable them to be used for other purposes when there is no professional work more urgent.

As to its composition, its officers should be educated and competent engineers, the captain preferably a supervising constructing engineer of previous military experiences. The enlisted force should include engineers of various specialties, contractors, surveyors, draughtsmen, photographers, carpenters, blacksmiths, masons, lumbermen and other mechanics, as well as men familiar with the use of explosives.

Although the engineers of the Army are armed with the rifle, it would probably be better for the National Guard engineers to be armed with the carbine and the revolver. These weapons can be carried more easily than the rifle, are efficient, and do not so much encumber a man who has something to do besides shooting.

The first drills should be for the purpose of putting the company on as firm and excellent a military basis as the other organizations of the Guard. Much engineer instruction should not be needed. An occasional paper on the more important subjects—as for example, hasty bridges, defense of buildings, cars, etc., use of explosives—will suffice for many of them, provided the principle is followed of lifting each jug by its own handle. Each man will thus have less to learn. He will further know better what to expect. Other things being equal, he will be more resourceful in an emergency and possibly more steadfast in his work, than another equally patriotic man for whom the work is quite different from what he is accustomed to in daily life.

For the engineers of an army in the field, one of the first, most important and continuous duties is the procuring, revising, adjusting and duplication of maps. So far as practicable, available maps are secured and used. But they rarely give the full information desired for the military purpose in view, unless it is clouded with much that is valueless. It must be borne in mind that maps are frequently very essential for the use of men not at all accustomed to map making, and they should therefore

be as clear as possible, be of suitable scale, give all the information needed, and very little else. In the field the maps obtainable usually have to be supplemented with information acquired by reconnoissances made at the time. These have been made with varying degrees of accuracy and with the various surveying instruments familiar to engineers and surveyors. Of recent years the greatest progress in this line has been along the development of a type of readily portable combined surveying instrument and drawing board, not very accurate but generally sufficiently so for the purpose in hand.

Most of the National Guard duty proper will be in places which have already been carefully mapped, and it will not often be necessary to make a complete survey. But it may be necessary to prepare from maps already made, one suited for use in a particular emergency. This should indicate, for example, streets, street-car stables, police stations, fire engine station-houses, fire plugs. Having in mind the transportation of troops, one might be needed showing only a few streets but indicating the car lines and the transfer points. Much mapping work of this kind can be done by a few good draughtsmen. If the commanding general wishes a single map of a small section of a city only, the engineers should be able to prepare it for him on short notice. If he wants 20 copies, say, they prepare the map on tracing linen, making blue-prints from it, if it is in the daytime and the sun is high. If not, they may make a contact negative, from which duplicates can be made by black printing or by some other process. For this purpose a few photographers are needed. Much surveying may not be necessary, still some will surely be needed, particularly in case of service in a strange locality. The dimensions and details of some building may be required. Army Regulations require a route sketch of every march made by the troops.

It is customary in the Guard to look to the Quartermaster to lay out the camp, plan and construct camp structures. The Quartermaster is usually a hustler and a man of experience, but he is not, necessarily, a man of experience in lines, angles, distances and miscellaneous construction work.

These things are the simple problems for an engineer, provided he appreciates the requirements of the situation. Each

regiment of infantry should of course have some officers and men in it specially prepared to lay out a camp promptly and properly. When quartered in buildings, it may be necessary to put in more troops than the building is intended to accommodate. The company should include one or more sanitary engineers as well as some carpenters and plumbers who can recommend and supervise, and, in an emergency, do any work that may be necessary to make the accommodations adequate. The company should contain men who can run a railroad train and repair a steam or trolley road.

It is a sound general principle, in such matters as these, that each organization, regiment and company of whatever kind of troops, should, as far as possible, be able to do everything of an engineering nature, as well as every other that is essential for itself. But it is best that an engineer organization should have considered the matters and, when desired, be able to advise intelligently and even to supervise the work for them.

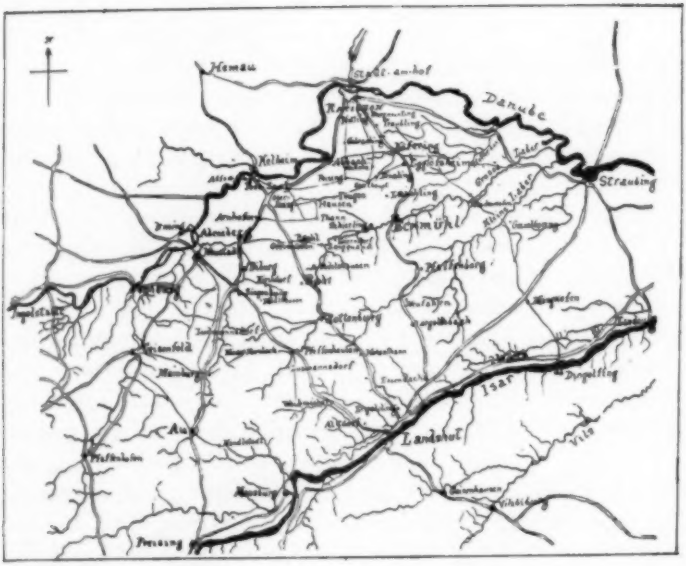
If time allows, sufficient instruction may be had in handling heavy military weights, in mounting guns, building emplacements, and other operations which would make the troops still more useful in case of war. The great advantage of having this organization will consist in having a body which will be constantly ready in engineering matters, and to which you can turn at once for anything needed in their line.

One fault to be guarded against by engineers accustomed to accurate work is that they may not be satisfied to do the job approximately well. They should remember that it is frequently far better, in this class of work, to do the job just good enough to accomplish the purpose and get it done when needed, than to do only half of it and have that half excellently done.

The question of tools and materials should be a simple one in the Guard, as the service is usually so near sources of supply. Probably one wagon would carry the articles which would probably be needed most urgently by the company. In certain emergencies many more tools might have to be provided for the use of the brigade. This matter should, in due course, be examined into by the Chief Engineer, and lists prepared and kept on file in his office.

In conclusion, there is manifestly a considerable field for

military engineering in the National Guard. It will be useful both in increasing the effectiveness of the service in its State duties and in preparation for duties incident to war with foreign powers. Through this channel a great body of patriotic citizens who do not render a term of service in the Regular army, may receive the small amount of training they require to make their valuable service more immediately available at critical times.



THE MANŒUVRES ABOUT ECKMÜHL.

THE CAMPAIGN OF ECKMÜHL, 1809.—

NAPOLEON'S MOST BRILLIANT MANŒUVRES.

By FREDERIC LOUIS HUIDEKOPER.

II.

[*Continued from July Number.*]

FOR the 16th the Archduke made the following dispositions. On the right Rosenberg was to debouch from Dingolfing and send his advance-guard on Ergoldsbach, thus threatening Deroy's rear and cutting his communications with Ratisbon. Veczay (Klenau's division of Kollowrath's corps) was to extend by Menghofen to the Kleine Laber and to reconnoitre the bridge at Straubing so as to communicate with Bellegarde.* In the centre the Archduke with the corps of the Archduke Louis, Prince Hohenzollern, Lichtenstein and Kienmayer should advance on Landshut while Hiller was ordered to move on the right to Moosburg, to observe the road to Munich, and to get news of the French. The advance-guard of the centre column reached Landshut before dawn, but it was not until 11 o'clock that it was directed to attack in order to protect the construction of a bridge. The artillery, far superior in number and calibre, soon silenced the Bavarian guns, the bridge was completed, and at 2 P.M. the advance-guard, followed by the Fifth corps (Archduke Louis) crossed the Isar and deployed. A short cannonade ensued, which in conjunction with the movement by Rosenberg through Dingolfing and Wörth, compelled Deroy to evacuate this important point and to retire, in good order however, on Pfeffenhausen. The Austrian cavalry followed to Weihmichel, the Fifth corps to Ergolding, the Third corps (Hohenzollern) to Landshut, and the Reserves in the rear. Rosenberg crossed at Dingolfing to Och and Ergoldsbach, after driving back the Bavarian cavalry; Hiller occupied Moosburg by his cavalry only and Jellachich entered Munich.

* Compare Hamley, p 147.

Meanwhile the judicious movement of Davout from Nuremberg through Hemau toward the Danube had been arrested on the 13th by Berthier and the direction changed from Ingolstadt to Ratisbon. The abominable roads, the lack of provisions, and the inevitable scattering of the divisions had so delayed this dangerous march that, on the night of the 16th, Davout had only succeeded in reaching Ratisbon with Saint-Hilaire and the Heavy Cavalry. He had remonstrated vigorously against this movement*, but had been peremptorily ordered to obey by Berthier and had no other alternative.

Meanwhile Napoleon, traveling as fast as horses could carry him, had reached Stuttgart shortly after midnight on the night of the 15th–16th and turned north to Ludwigsburg, where he arrived at 3 A. M. on the 16th.

At 4 A. M. he wrote to Marshal Masséna:—

"My Cousin,

"I have reached Stuttgart. I suppose that you occupy the bridgehead of Landsberg by a detachment and that you have had patrols made on your extreme right. I have learned that General Oudinot has been sent on Ratisbon. I have ordered him to stop his movement and keep himself within reach of you in order that he can rejoin you under Augsburg before the enemy and that if the Austrians attempt anything, your corps, that of Oudinot, that of General Vandamme and that of the Duke of Dantzig would be united.

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* "Ingolstadt, April 14th, 1809, 7.15 P. M. * * * I shall leave to-night for Ratisbon; I shall do what I can to assemble my army there to-morrow. * *

I cannot dissemble from you that I very much fear to arrive after Ratisbon will have been evacuated * * * It seems to me that the best manœuvre to make is to debouch through Ingolstadt. * * * The Austrians would not have attacked General Friant and General Saint-Hilaire several days ago if they had not had some plan. * * *

In this state of things I think that what would be best to do would be to debouch through Ingolstadt, and it would be easy there to unite promptly all the army. * * *

The roads to reach Ratisbon are detestable; there is only one which issues toward the city and which is not merely a defile for the two leagues preceding it. * * *

Then if Your Highness persists in the execution of his orders, I will execute them. * * *

I await with impatience the reply of Your Highness.

Finally, in the hypothesis that the enemy will debouch by several points and in great force on the Isar—as is announced to me—I beg Your Highness to have me informed what I should do.

It is impossible for the army to be assembled at Ratisbon before forty-eight hours and prior to this space of time, it can be ready to debouch through Ingolstadt, occupying all the crossings on the Altmühl.

Your Highness will remember, that in assembling at Ingolstadt I conformed to the dispositions which had been prescribed to me.

P. S.—In case the information on the enemy's movements should be inexact, I ask to be allowed to go to Ratisbon by the right bank."

Davout, Corresp. vol. II, pp. 464-467.

Have a position reconnoitred which is far enough in the rear of Munich—that of Dachau.

I wait to know what the enemy shall have done on the side of Bohemia.

It is thought that the battalions which ought to come from Italy to reinforce you, will have been prevented by the insurrection of the Tyrol and will have retrograded on Trent.*

Write me at Dillingen, where it is possible that I may go this evening.

"NAPOLEON." †

P. S. Put yourself in communication with General Oudinot.‡

Later he wrote to Berthier :—

"My Cousin,

"I have received your letter by which you announce to me that you have made the corps of Oudinot leave for Ratisbon. *You do not inform me what necessitates such an extraordinary measure, which enfeebles and disseminates my troops.*§ I think that, if you had not been brought to this decision by extraordinary motives, you will order General Oudinot to stop his movement and to place himself between Ratisbon and Augsburg in order to be ready to move on this latter place if the case demanded. As for the order to occupy Straubing by General Wrede I do not understand it, because I am ignorant why he has evacuated it.‖ Marshal Lefébvre did well to concentrate his forces at Munich ; two divisions are stronger than one. I do not well understand the spirit of your letter of the evening of the 13th and *I should have preferred to know that my army was concentrated between Ingolstadt and Augsburg, the Bavarians in the first line*§ —as the Duke of Danzig placed himself—until one knows what the enemy wants to do. I am awaiting news of the Duke of Auerstädt.¶ One must conform with my instruction—which is to rally my army and have it in hand. If the enemy should debouch from the Tyrol and one be compelled to give battle at Augsburg without General Oudinot's being there, it would be a great misfortune. If, on the other hand, one were obliged to abandon Augsburg, which is not yet in a state to defend itself, and thus to deliver our magazines at Ulm, it would still be a great misfortune. *All were perfect had the Duke of Auerstädt been near Ingolstadt, the Duke of Rivoli with the Wurtembergers and the corps of Oudinot near Augsburg.*§ Since the enemy has attacked, one must know what his plan is. The principal is that Oudinot should be at Augsburg before the enemy and should have his eyes wide open. *As for the Duke of Auerstädt, the divisions of St. Hilaire, Nansouty, and Montbrun, the instruction is for them as for everyone else—to concentrate between Ratisbon, Ingolstadt and Augsburg—so that one must do exactly the opposite of what you have done.*§ It is possible that I shall leave here to day so as to arrive at Dillingen this evening. Write me by this road.

"NAPOLEON." **

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* The insurrection in the Tyrol broke out on the night of April 8th and Bisson's division was surrounded near Innsbruck and compelled to surrender on the 12th.

† Napoleon Corresp. 15,071. Vol. 18, p. 473.

‡ Pelet, tome 2, p. 398.

§ The italics are ours.

‖ By order of Berthier.

¶ Davout's dangerous isolation had naturally made the Emperor extremely apprehensive.

** Napoleon, Corresp. 15,070. Vol. 18, pp. 472-473.

The Emperor did continue on to Dillingen where he met the King of Bavaria,—who had there taken refuge with his Court,—and at 3 o'clock on the morning of the 17th he reached Donauwörth—the place where he had selected for General Headquarters.* Berthier had gone to Augsburg taking General Monthion with him and there was absolutely no one left in charge.† The multitude of the contradictory despatches issued since the 13th by Berthier had produced such confusion that no one knew the situations of many of the divisions nor whither they were moving. Masséna was known to be at Augsburg, Oudinot somewhere between that city and Aichach, and the Wurtembergers on the Lech. The exact positions of the Bavarian divisions were unknown, although it was later learned that Lefébvre was at Geisenfeld. Davout's isolation caused the greatest apprehension in the Emperor's mind; Vandamme assured him that he was at Ratisbon, but it was evident that no one knew with any degree of accuracy. Beyond the fact that the Austrians had debouched from Landshut the movements of the enemy's other columns were surrounded with uncertainty—one fact alone stood out with awful distinctness, viz.: that the Grand Army had been divided by the "Major General" into two nearly equal parts, one of which was grouped about Augsburg and the other somewhere about the Danube near Ratisbon, separated from the other by a void of not less than 94 miles, where only 30,000 Bavarians were bravely attempting to oppose the enemy's pronounced advance which was rapidly cutting the army in two. It seemed as if the hero of Auerstädt, threatened on the south by the Archduke with 153,000 men and on the north by Bellegarde with 54,000, were infallibly doomed to the fate of Mack. Truly the situation was appalling. In the more than usually characteristic slowness of the Austrian advance there reposed the one forlorn hope for safety—a chance so slight that it would have been regarded as despairing by any ordinary commander. But no task was too stupendous, no hope too forlorn for the great Napoleon, and he promptly bent all his marvelous energy and superhuman genius to extricating his im-

* Vide supra.

† In the order of March 28th, Napoleon had directed that "General Monthion should be at Donauwörth with the bureau of the Staff." Napoleon, Corresp. 14,965. Vol. 18, p. 397.

perilled legions from their desperate situations.* Unlike Alexander he did not cut the Gordian knot, he unraveled it, until out of the chaotic snarl came order, system, and astonishing success, and it may be well worth our while in following his manœuvres to bear continually in mind the five great characteristics of his system of strategy, viz.: (1) The initiative at the commencement of hostilities; (2) One line of operations; (3) The unity of forces; (4) The rapidity of movements on decisive points; and (5) The invariable concentration before every battle.†

Staff officers were immediately sent in every direction to obtain accurate information on the whereabouts of the French divisions as well as of the enemy, and the reports which came pouring into the headquarters helped to throw light on the intricate condition of affairs. The Emperor's first letter was sent to Berthier at Augsburg:—

"My Cousin,

I have arrived at Donauwörth. I should very much have desired to find you there, but, in the idea that I was going to Augsburg, you left for that city. I am absolutely ignorant of where the Duke of Auerstädt is, and I see that nobody knows precisely where he is. General Vandamme assures me that the enemy is at Ratisbon. That being so, it seems to me that my position is more naturally established here than at Augsburg. Donauwörth being the headquarters and the point of assembling for two corps, I should have desired that, in going to Augsburg, you should have left Monthion here. Proceed hither as quickly as possible. It appears that the Duke of Danzig has retired to Geisenfeld; it seems to me that he is falling back a great deal on his left.

"NAPOLEON."‡

At 8 A. M. the Emperor addressed the second of his many orders to Marshal Lefébvre at Geisenfeld:—

"I have arrived at Donauwörth where I opened the letter which you wrote on the 16th at 9 A. M. to the Prince of Neuchatel. I remain here.

Send me an officer who knows perfectly the situation of your troops and what is happening, so that I may be perfectly acquainted with everything. Inform me yourself where you believe the principal forces of the enemy."§

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*Napoleon is said to have declared to one of his Ministers, who joined him a few days later, "You cannot picture to yourself in what a condition the army was, and to how many misfortunes we were exposed had we had an affair with an enterprising enemy. They shall not again surprise me thus."

† Vide the writer's article on Napoleonic Strategy in the JOURNAL MILITARY SERVICE INSTITUTION for January, 1901. The Austrians had in this case taken the initiative.

‡ Napoleon, Corresp. 15,073. Vol. 18, p. 474.

§ *Ibid.*, 15,074, p. 474.

The third order was sent at 10 A. M. to Davout at Ratisbon :—

"My Cousin,

"I have arrived at Donauwörth. I learn that you occupy Ratisbon. *My intention has always been to concentrate my troops behind the Lech. Fall back with all your troops on Ingolstadt.** I am ordering the Duke of Danzig to keep the corps at Landshut at a distance and to protect your movement. Friant's division should also fall back on Ingolstadt; he can however guard the posts of observation on the Altmühl, considering the Altmühl as a great bridge-head six leagues from Ingolstadt. *Keep your troops massed and in order ;** and if, in this abrupt movement which the enemy does not expect, you find the means to fall upon the column at Landshut,† if it has not advanced, it will be a superb occasion ; but do not go out of your way more than half a march to bring it about.

To proceed to Ingolstadt, you should pass through Neustadt. From Neustadt, where you cannot be before to-morrow evening the 18th, I shall be ready to give you orders. However, if you do not receive any, you should continue your movement on Geisenfeld, thus being three leagues [*i. e.*, 5.1 miles] from Ingolstadt, without ever crossing onto the left bank.

I await with impatience news of the enemy. What is the Austrian *corps d'armée* which has debouched at Landshut? Where is it moving? What is the march of the enemy's other columns, of which you or General Wrede should have knowledge? "‡

The fourth order, issued at the same time, was to the trusted Chief of Engineers at Augsburg :—

"General Bertrand,

"I have arrived at Donauwörth ; proceed there without delay. I have written, by an aide-de-camp of the Duke of Rivoli, to the Prince of Neuchatel to proceed to Donauwörth. As soon as you receive this, proceed to him and assure yourself that he has received my letter, without which yours will serve him.

Inform the Commandant of the place and General Oudinot that I am here. Also see the former Elector of Treves ; tell him the same thing and add that I shall not delay coming to see him."§

At 11 o'clock a second order was sent to Marshal Lefébvre at Geisenfeld :—

"My Cousin,

"I am ordering the Duke of Auerstädt to move first through Neustadt to lean on Ingolstadt. *My intention is for you to proceed to the advance guard at Neustadt*, where General Wrede is to be found, *and to unite your troops to keep the corps at Landshut at a distance or to move to the aid of the Duke of Auerstädt if necessary, while he will make his movement, and to co-operate in defeating the corps of Landshut,** if the unexpected return of the Duke of Auerstädt surprises it and gives him the chance to do it harm. I await with impatience news of the enemy. What is the Aus-

* The italics are ours.

† The Archduke Charles with the Austrian centre.

‡ Napoleon, Corresp. 15,075. Vol. 18, p. 475.

§ *Ibid*, 15,076, p. 475.

trian corps which has debouched at Landshut? Where is it moving? What is the march of the other columns of which you or General Wrede should have knowledge?

P. S. I have this instant received the subjoined letter from General Wrede. *You know how important it is to keep your corps united to support the Duke of Auerstädt and to give him time to fall back upon Neustadt and Geisenfeld.* * There is no inconvenience in your informing him of the positions you take and to protect his movement and in your notifying him that I sent him, at 10 A. M., the order to move on Ingolstadt by the right bank of the Danube." †

At midday the Emperor dictated to General Wrede at Biburg the following order:—

"His Majesty having himself arrived on the line of his army has ordered the Duke of Auerstädt to unite all his corps on your advance guard and to manœuvre between the Isar and Neustadt to contain the enemy's column and to favorise the movement of the Duke of Auerstädt, *so that the army will be united between Ingolstadt and Augsburg.* *

Write to the Duke of Auerstädt that he has received the order directly from the Emperor, by one of his orderly officers leaving at 11 A. M., to proceed to Neustadt with his whole corps; that if he had not received this order, you are authorized to write him about it, because the order might have been intercepted and that the order to leave Ratisbon and to proceed to Neustadt should be considered as an order from the Emperor signed by him of which you are charged to transmit the duplicate to him. ‡ That holds to the Emperor's intentions which desire to have all his people in hand.

It is possible that the sudden return of the Duke of Auerstädt, who has with him more than 60,000 men joined to the Bavarian corps, puts you in position to crush the enemy who has debouched by Landshut. You will receive orders from the Duke of Auerstädt, but I am writing you directly so that you may manœuvre in consequence, independently of the other Bavarian corps." §

During the morning Napoleon had written to Masséna at Augsburg:—

"I have received your letters of the 15th and 16th of April. I have done nothing but arrive at Donauwörth. It is possible that before going to Augsburg I shall go to the corps of the Duke of Auerstädt. Keep yourself always ready with the means of 4 days' bread, so as to be able to march the moment the enemy shall approach a little and one can thoroughly know his dispositions." ‖

At 1 P. M. he again wrote Masséna:—

"During the night you will receive the order to leave to-morrow, at 2 A. M., with your *corps d'armée* and that of General Oudinot. The Major General is drawing up your instructions at this moment, but you should make your dispositions upon receipt of this letter. Prepare four

* The italics are ours.

† Napoleon, Corresp., 15,077, vol. 18, p. 476.

‡ Observe the precautions taken to insure the execution of the desired retrograde movement by Davout and the manner in which each general was apprized of the Emperor's plan and the part which each one was to take.

§ Napoleon, Corresp. 15,078. Vol. 18, pp. 476–477.

‖ *Ibid.* 15,079. p. 477.

days' biscuit, four days' bread, and organize Augsburg as if this place were to be beseiged. * * * Have all the gates of Augsburg closed; let no one enter or leave there, so that they will be ignorant of your movement. Let the cavalry corps which you have, prevent their going along the road to Munich. * * *

*The object of your march is to combine with that of the army to take the enemy in the very act and to destroy his columns.** It is therefore necessary for you to be light, not to have any tail (to your column), for the artillery park to be with the *corps d'armée*, for nothing to be left on the road two hours after it shall have debouched. Answer me during the night and inform me whether there is sufficient ammunition, supplies and provisions at Augsburg; you know that I speak in case of a siege. If there is enough ammunition and supplies to hold out twelve or fifteen days, that is all that is necessary. In leaving, you will put the place in a state of siege and from this moment everyone should obey the commandant. * * *

Spread the rumor that you are marching partly into the Tyrol and partly on Munich. * * *

Make your dispositions already so that at 4 A. M. the tail of your columns shall have got beyond Friedberg. Push strong reconnaissances on Dachau in order to be assured when you leave, that the enemy's infantry has not reached this position.

See to it that I shall receive during this night the report of the condition of your corps in men, horses and infantry and gun cartridges.

"NAPOLEON."

P. S. Prepare everything; do not make a single premature exposure, and do not let these dispositions be known to the public until you shall have left. †

At 6 P. M. he wrote to Davout at Ratisbon:—

"My Cousin,

"Since this morning when I arrived, I have sent you General Savary, my orderly officer Vence, and artillery officer, a Bavarian major, and I have charged General Wrede and the Duke of Danzig, to whom I have written on several occasions, to inform you of my intentions. It is 6 P. M.; I am sending you your aide-de-camp who carries to you the duplicate of my orders and who promises me to arrive before 6 A. M. Cannon have been heard between Pfaffenhofen and Freising.

The Duke of Rivoli and General Oudinot leave Augsburg before dawn to direct themselves through Aichach on Pfaffenhofen. Nansouty's division, General Demont‡ and General Vandamme will be at Ingolstadt where, I believe I shall be to-morrow; the Bavarians between Neustadt and Ingolstadt. Thus I hope to have news from you twice to-morrow since *we are marching to meet each other.** I do not know whether the enemy occupies Straubing in force or whether he debouches from this side. I am ignorant of what is on the Altmühl. *To-morrow will be a preparatory day to draw nearer*,* and I suppose that, Wednesday,§ we can, according to circumstances, manœuvre on the columns which have debouched by Landshut and elsewhere and put to

* The italics are ours.

† Napoleon, Corresp. 15,080. Vol. 18, pp. 477–479.

‡ Demont's division was composed of the 4th battalions of 14 different regiments and was destined for Davout's corps. Vide order of March 21st to Berthier. Napoleon, Corresp. 14,934. Vol. 18, pp. 376–377.

§ April 19th.

rout what may be between the Danube, the Isar, and perhaps even the Inn. Mask your movement from Bellegarde the most you can, save, having obtained advantages on the Isar, to return on Ratisbon if General Bellegarde engages himself there. * * *

*If the cannon continue to fire against the Bavarians to-morrow, accelerate your march to go to their aid.** It may be that after to-morrow you can do a great deal of harm to the enemy's column of Landshut. *Everything leads one to believe that the road has not been intercepted on the right bank;** however you may correspond by both roads. The essential is to give a great deal of news of yourself and to inform what you may have learned at Ratisbon.

*Your five divisions including that of General Demont, the six divisions which the Duke of Rivoli brings, the three divisions of cuirassiers are able to defeat all the forces of the Austrian Monarchy united; but above all things our communications must be assured and we must march with system.** If you arrive to-morrow at Neustadt you will be eight leagues† from my headquarters, just as I shall be eight leagues from the Duke of Rivoli. The Duke of Danzig will be still nearer. I can thus give orders to-morrow afternoon for the completion of the meditated operation. General Rouyer will be at Nördlingen to-day, and to-morrow at Donauwörth. Leave only the barely necessary cavalry in observation and take with you all that you can.

"NAPOLEON."‡

Conformably to orders Berthier had returned to Donauwörth§ and at 7 P. M. the Emperor dictated the last order addressed to Masséna.

"The Emperor has notified you, monsieur le duc, that you should make a movement to-morrow. *The intention of His Majesty is for you to leave to-morrow before daybreak, directing yourself on Aichach and Pfaffenhofen.** Some cavalry, some infantry nearest in reach, some pieces of artillery will form the advance-guard and reach Pfaffenhofen in the evening. All the troops which you have farthest away will get beyond Aichach during the day, and your six infantry divisions will thus be in echelons between Aichach and Pfaffenhofen. Order strong cavalry patrols to move on Dachau to get news of the enemy, which will be transmitted you at Aichach. The Emperor will probably be at Ingolstadt. It will, however, be necessary for you to send him news of the enemy by the road from Aichach to Rain. The Bavarians will be between Pfaffenhausen aud Biburg. *Thus our army will be united to manœuvre in concert against the enemy's corps which have debouched by Freising and Landshut.** You will march, mon. le duc, immediately after your advance-guard so as to be able to manœuvre according to circumstances. * * * The Emperor does not need to observe to you that in this march you should reconnoitre far on your right so as to be forewarned in time, of all that is occurring. * * * Take with you all the bread and biscuit you possibly can. Inform me the hour when

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*The italics are ours.

† 21.6 miles.

‡ Napoleon, Corresp. 15,081. Vol. 18, pp. 479-480.

§ Savary tells us (Memoirs of the Duke of Rovigo, Vol. II, part 2, p. 49) that Napoleon said to Berthier: "What you have done appears to me so extraordinary that, if you were not my friend, I should suspect you of betraying me, for Davout is really at present much more at the disposition of the Archduke Charles than at mine."

you think you will have arrived in person at Aichach and the place where your headquarters will be. * * * "*

We have quoted in *in extenso* these important orders for the reason that they afford an insight into Napoleon's method of grappling with such intricate problems as nothing else possibly can. Just as the stability and permanency of every construction, architectural or otherwise, depends principally upon the foundation, so upon these preliminary orders was based the wonderful plan of extricating the French divisions and diverting the disaster onto the Austrians—a plan which for soundness and brilliancy must forever excite the admiration and astonishment of military men. These orders show that Napoleon understood that the Austrian movement had been pronounced between the Isar and the south bank of the Danube; that unless remedied the French centre, filled only by Bavarians, would surely be broken; and that the wings at Ratisbon and Augsburg were useless in those positions—the former being especially isolated and in danger of being crushed between Bellegarde, —whose corps concentrated at Schwandorf were showing considerable aggressiveness—and the Archduke on the Kleine Laber. Should the opposition be first directed against Bellegarde, who was threatening the communications of the Grand Army, or should the concentration be made by the right bank? The French had occupied and partly fortified Landsberg, Augsburg, Rain, Ingolstadt and Ratisbon, and he therefore decided to mass his troops within this right triangle, concentrating on the line of the Abens on the centre because the Austrian movement through Landshut was evidently directed against the left.† He hoped that on the 18th Davout could retrograde to Neustadt (21½ miles) while Masséna and Oudinot advanced to Pfaffenhofen (35 miles). It is true that while the Archduke's army was massed and advancing with solid fronts well in hand, the French army was widely scattered and dangerous flank marches would be necessary for the wings to concentrate on the centre, but Napoleon knew wonderfully well how to compute the chances *pro* and *con*, the situation of both armies and their composition; he, who understood so well how to utilize the "per-

* Pelet, tome 2, pp. 403–405.

† "It is a fundamental rule in war to know how to sacrifice secondary to primary points."—A. G. Maximes de guerre de Napoleon I., p. 98.

sonal equation," knew that he could count on the activity and zeal of the French, the characteristic slowness of the Austrians, and the tremendous moral effect of his own presence. By his able measures he rendered these dangerous flank marches perfectly assured. If the enemy should advance against the centre he would gain time in this difficult country to await part of his army and would fight one of those masterful battles in which he was almost sure of victory. If the Archduke should turn toward Augsburg he would find that city so fortified as to check all further advance in that direction and Ratisbon was also presumed to be in a similar state of defense. In both of these suppositions Napoleon would fall upon his rear and drive him either into the Danube or on the Tyrol. Thus in the manœuvre against an Austrian movement on Ratisbon, the French assembled between the Danube and the Isar would drive the Archduke into the *cul-de-sac* formed by the confluence of these rivers and, provided possession were gained of the bridges at Ratisbon and Landshut, annihilate his entire army. Thenceforth it was only a question of drawing in the wings of the French army by long and audacious flank marches protected by the Bavarians whom chance had placed in the centre. From that hour there was no hesitation in Napoleon's course; "*L'audace, toujours l'audace*" was his motto,* and one may search in vain for a finer example of boldness, coupled with soundness of resolution, in a life filled with remarkable decisions.

On the 17th the Archduke realized the imperative necessity of hastening his march, but even so, his advance was limited to 5 miles by the lethargy of his cumbersome army, accustomed to move so extremely slowly. That night the Archduke occupied Weihmichel with the Fifth corps (Archduke Louis), whose advanced guard attacked the Bavarians (Wrede) near Hornbach and drove them back beyond Seigenburg; Hohenzollern and Rosenberg followed the Rottenburg road to Hohenham and Essenbach; the Reserve corps (Lichtenstein and Kienmayer) to Altdorf and Ergolding, their light troops on the Laber. Rosenberg's detachments pushed on Ratisbon reported

* "True wisdom for a general is in an energetic determination" Napoleon, Précis des guerres de Frédéric II. 16th observation. Corresp. Vol. 32, p. 209

the important information that there were French troops at Köfering and that Davout's corps was still at Ratisbon. Hiller reached Moosburg and extended to Mainburg (on the Abens) and Nandelstadt while a strong detachment was sent to Pfaffenhofen.* The general direction of the Sixth corps was through Au to contain and observe all movements from Augsburg, joined by Jellachich from Salzburg. These movements of the 16th and 17th initiated the direction of the Austrian forces to the Danube at Kelheim and Neustadt; they had for their purpose "the dispersion of the enemy's corps and for an object to pierce to the midst of these corps in order to cross the Danube between Ingolstadt and Ratisbon, and to take the direction of Eichstätt, where the Second corps should move by Beilingries and the First by Neumarkt." †

Meanwhile Davout's divisions were concentrated about Ratisbon with the exception of Friant posted at Hemau to assure the communication with the Imperial headquarters.‡ Lefébvre's divisions were assembled at Vohburg, whither Deroy had retreated covered by Wrede, but fortunately *the Archduke did not follow up his advantage in full by occupying Siegenburg in force, which would have cut the French army in two and probably have forced Napoleon to renounce all attempt to concentrate south of the Danube.* Oudinot remained at Aichach and Masséna was busy drawing in his divisions scattered at Landsburg, Zumarshausen, Ursberg, and Schwabmunchen, an operation which requires nearly 36 hours.

During the night of the 17th–18th additional reports received at Donauwörth brought accurate information about the enemy's columns, their positions and the direction of their march. In spite of appearances Napoleon judged the movement on Neustadt and Kelheim too bold and too much extended to account for its slowness; he studied with great care the manœuvres of Bellegarde and knowing that they must be subordinated to those of the Archduke became convinced that the latter was moving on Ratisbon. The development of the Austrian move-

* Compare Hamley, p. 147.

† Letter of Archduke Charles to Count Bellegarde. Pelet, tome 1, pp. 239-240.

‡ Davout (Ratisbon, April 17th) to Berthier. Vide Davout Corresp. Vol. II.,p 475.

ment showed plainly what could be done and what attempted. Napoleon therefore enlarged his own movements and, no longer confining his efforts to reuniting the French army, he took steps to gain the enemy's left, his rear, and even his communications.* Accordingly at 4 A. M. on Tuesday, the 18th, he wrote to Lefébvre:

"General Savary has arrived; he has remitted to me your two letters, which inform me that you have received my orders. I trust that at 3 A. M. you will have had the division of the Prince Royal put on the march to move forward *in order to unite your three divisions.*† It appears that the Archduke Charles with three *corps d'armée* is directing himself between Landshut and Ratisbon; *you must therefore manœuvre on his left flank to retard his march on Ratisbon*, now your communication with the Duke of Auerstädt, *and to make a diversion which occupies a number of men equal to your own.*† I hope that before 9 A. M. you will be in person with the divisions of Wrede and Deroy, and you will make the Bavarians understand what I expect from them in these days. I hope that before 11 o'clock the division of the Prince Royal will have rejoined and *that you will fight with more or less activity*,† according whether you will learn that the Duke of Auerstädt is more or less engaged.

The Duke of Rivoli and General Oudinot are on the march for Pfaffenhofen, where they will be this evening. I go myself to Ingolstadt. Send me news of yourself often during the day, if that be necessary. *You know the urgency of the situation; I do not need to recommend to you to act seriously.*† Communicate with the Duke of Auerstädt and make him understand what you will learn through deserters, in order that he may act according to circumstances."‡

To the commander of the right wing, Marshal Masséna, he sent the following long order to Aichach:—

"My Cousin,

I have received your letter. The division which you have at Landsberg § and the four regiments of light cavalry should try to reach Aichach, or at least to make what (distance) they can on the road from Augsburg to Aichach, *but it is indispensable for General Oudinot, with his corps and three other divisions, for your cuirassiers and whatever other cavalry you have, to sleep at Pfaffenhofen.*†

In a word you are going to understand what is the matter. Prince Charles, with all his army, debouched yesterday from Landshut on Ratisbon; he had *three corps d'armée* valued at 80,000 men. The Bavarians fought all day with his advance-guard, between Seigenburg and the Danube. However, to-day, the 18th, the Duke of Auerstädt, who had 60,000 Frenchmen, leaves Ratisbon and moves on Neustadt. Thus he and the Bavarians will act in concert against Prince Charles. During the day to-morrow, the 19th, all of your corps which will have reached Pfaffenhofen, to which will be joined the Wurtembergers, a division of

* "The greatest secret in war consists in becoming master of the communications of the enemy." Jomini, Grand Military Operations. Vol. 2, p. 59.

† The italics are ours.

‡ Napoleon, Corresp. 15,086. Vol. 18, p. 483.

§ The first division under General Legrand.

cuirassiers and all that can, can operate either to fall on Prince Charles' rear or on the column from Freising and Moosburg, and finally enter into line. *Everything leads one to think that between the 18th, the 19th, and the 20th all the affairs of Germany will be decided.** To-day, the 18th, the Bavarians can still continue to fight without great result, since they are always giving ground, but they are harassing and delaying just so much the march of the enemy's army. The Duke of Auerstädt is notified of everything, and General Wrede sends him all the prisoners. To-day it is possible that only a few shots will be fired. Between Ratisbon and the place where Prince Charles was, there were only nine leagues, It is therefore not until the 19th that something may be had, and *you will actually see at a glance that never did circumstance want a movement to be as active and as rapid as this one.** Doubtless the Duke of Auerstädt, who has about 60,000 men, can with rigor get himself honorably out of this affair, but *I regard the enemy as lost if Oudinot and your three divisions have debouched before dawn, and if, in this important situation, you make my troops feel what they must do.** Send cavalry posts to a distance. It appears that the Austrians have only at Munich and in that direction a corps of 12,000 men. *The importance of your movement is such that I may come myself to join your corps.** Your cavalry which was at Dachau can leave there, to direct itself and come to join you at Pfaffenhofen. As for the General who is at Landsberg he forms with his body your rear guard, which will be six or seven hours distant. That may be useful and has no inconvenience. If necessary he will always have rejoined on the second or third day. Finally the four regiments of light cavalry can, during the day to-morrow, or day after to-morrow at the latest, have rejoined your head.

"NAPOLEON."

Activity, activity, rapidity; I recommend myself to you! †

Nansouty with his cuirassier division and Vandamme with the Wurtemburgers was ordered to Ingolstadt whither the Emperor, accompanied by Marshal Lannes who had just arrived,‡ proceeded during the afternoon and established the Imperial headquarters. He at once sent an officer through Vohburg and Neustadt to carry news of Lefébvre to Davout and the information that the Emperor would probably go to Neustadt, and on his return to give information of Davout to Lefébvre and Wrede. §

During the day neither Davout nor Masséna, in spite of Napoleon's insistance and their own realization of the gravity of the situation, had been able to execute the orders sent them. The former, thanks to Berthier, was truly in a critical position; part of Bellegarde's forces had drawn down from the north, and

* The italics are ours.

† Napoleon, Corresp. 15,087. Vol. 18, pp. 483–484. Compare Pelet, tome 2, pp. 405–407.

‡ Thoumas, Le Maréchal Lannes, p. 278.

§ "Order to Captain Galbois," 5 P. M., Napoleon, Corresp. 15,091, p. 486.

had attacked him * and threatened to cut all communications north of the Danube, † while on the south Montbrun had encountered some of Rosenberg's detachments on the Grosse Laber. His orders were to retreat by the right bank and yet he had learned that the bridge of Abensberg, *the most important strategic point in the entire theatre of operations*, had been burned. He had been compelled so to scatter his divisions in order to be prepared for every eventuality that they could not be assembled south of the Danube until 8 P. M. He had written to Lefébvre and to the engineer officer at Ingolstadt to reëstablish this important bridge at Abensberg and did not doubt his ability to rejoin Napoleon in spite of the Austrians. ‡ Masséna too was unable to concentrate his divisions until the night of the 18th and accordingly did not arrive at Pfaffenhofen until the night of the 19th. Fortunately Oudinot at Aichach had been able to reach Pfaffenhofen during the day, thus forming the head of the Fourth corps, and Vandamme and Nansouty bivouaced that night about Ingolstadt. The Bavarians played their all-important rôle with vigor and success in the centre where it was so imperative to prevent the enemy from breaking through. Wrede attacked the Austrian (Archduke Louis) advance-guard on the heights of Mühlhausen, drove it back across the Abens, recaptured the bridge of Siegenburg and established his troops at Biburg, supported by Marshal Lefébvre with Deroy and the Prince Royal near Neustadt. This important operation cleared the territory where it was expected that Davout would form his

* Klenau (advance-guard of Kollowrath's corps) reached Rheinhausen on the 16th and had shelled Stadt-am-hof on the 17th.

† Davout (Ratisbon, April 18th) to Berthier.

"Monseigneur,

"It is probable that to-morrow one can no longer communicate with me by the left bank beyond the confluence of the Altmühl. I shall do all I can to send news of myself through Kelheim. Attempts must also be made to have orders reach me by that road."

Davout, Corresp Vol. II., p. 480.

‡ Davout (Ratisbon, April 18) to Berthier.

"General Friant is still eight leagues from here [*i. e.* 21.6 miles away at Heman,], the heavy cavalry five leagues. It will be 8 P. M. before I can have all of them on the right bank.

It is possible that you may blame me for this disposition of my troops; but when you will know that on my left flank I had Generals Bellegarde and Kollowrath you will explain easily to yourself the measures which I had been obliged to take to maintain the communication by the left bank of the Danube.

However to-morrow I shall be united and I answer you that the column from Landshut will not prevent our passing."

Davout, Corresp. Vol. III, pp. 478-479.

junction that night with Lefébvre, but the former as we have seen was unable to begin his retreat until late that night.

The 18th was the third day since the passage of the Isar, and yet the Austrian army had got only 22 miles from that river. The advance toward the Abens and the Danube was resumed; Rosenberg and Hohenzollern moving on Rottenburg, on the right of the Archduke Louis, followed by the Reserve corps in the centre on Pfaffenhausen, while on the left, Hiller —who had been ordered to support Louis—advanced to Mainburg. During the march, news was received that Davout's entire corps had reached Ratisbon; this caused a change in the former dispositions and resulted in Hohenzollern and Rosenberg—followed by the Reserves—being pushed across the Grosse Laber to Rohr. The Fifth corps alone remained on the road to Neustadt and that night occupied Siegenburg, in touch with Hiller's advance-guard under General Mesko at Mainburg. The corps of the right posted at Bachl and Langquaid* detachments which captured near Abbach an ambulance belonging to the French Third Corps and at Reising a despatch from Lefèbvre to Davout.† These two captures caused a revocation of the Archduke's orders for the 19th to continue the movement in three columns toward Kelheim "between the Abens and the Danube to prevent the junction of the French and the Bavarians" and the Generals assembled in the headquarters were instructed to change direction and to advance in three columns through Teugen, Dinzling and Egglofsheim on Ratisbon, while Kollowrath at Schwandorf was ordered to attack Ratisbon from the north bank. All the advantages so overwhelmingly on the Austrian side—which gave promise of every success—were thus renounced by the ordinarily masterful Archduke just at the moment when he had reached the goal of Abensberg. On the 18th he was opposed only by the Bavarians, supported that night by the Wurtembergers and Nansouty at Ingolstadt; *the superiority of numbers, concentration and interior lines were all*

* The positions given by Hamley (p. 148) are not all accurate.

† "You know, my dear Marshal, that I am here [Neustadt] to support you and to draw to myself a part of the enemy's forces if you were attacked. For this purpose I have sent a division to Siegenburg and to Biburg; two others are all ready to follow and to march against the enemy's left flank if you were attacked. Give me news of yourself and believe that, as a good neighbor, I shall do all that I can to renew to you the assurance," etc.

in his favor and a vigorous offensive on that day would have pierced the French centre and left him free to operate against Masséna or to crush Davout in conjunction with Bellegarde. The Austrian troops seemed to realize that the *sine qua non** lay within their grasp by the desperate manner in which they endeavored to drive back Wrede from Siegenburg, but the change of direction necessitated a suspension of these attacks and Wrede was therefore able to hold the important line of the Abens. The reason for renouncing these immensurable advantages is still inexplicable. Perhaps the Archduke feared "being attacked on all points by Davout" if he continued on to Kelheim and Neustadt, but we are more inclined to believe the true reason lay in the news of the arrival of Napoleon on the scene which invariably had a strangely paralytic effect upon nearly all his adversaries.

The night of the 18th–19th the Imperial headquarters at Ingolstadt got but little sleep. At 3 A. M. Berthier, at Napoleon's dictation instructed Lefébvre "to take a good position to fight the enemy with equal numbers and to have his seventy-two guns play if need be." He was informed that the Emperor would come to him, upon the first sound of the guns, with the Wurtembergers, the cuirassiers and Demont's division and he was recommended "to make bridges on the Abens below Abensberg; and *at all price to hold on to the bridge of this town*, on which Marshal Davout's junction would operate; *to fight in mass and united* * * *; *to attack strongly when they saw the head of the Third corps*† which will rejoin early." These orders were sent in *duplicata* and *triplicata*, and as the day wore on the Emperor became extremely impatient at receiving no further news or hearing the sound of any engagement and fearful lest his plans had miscarried. At noon he wrote to Masséna at Freising:—

"I have received your letter of 6 o'clock this morning. I suppose that you will have had the 4,000 men whom you have in front of you pushed in such a way that they will not escape, and that will not limit itself to the 400 prisoners which you announce to me.

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* "It is not sufficient to bring about a good operation in war by bringing our masses skillfully to bear upon the most important point. It is necessary to know how to engage them there." Jomini, vol. 2, p. 453.

† The italics are ours.

At Au and Freising there is nothing much; perhaps the rest of the corps that you defeated and which, in its entirety, was five regiments.

Our operations assume a shape. This is the true state of affairs. Prince Charles, with his whole army, was this morning a day's march from Ratisbon and had his line of operation on Landshut. The Duke of Auerstädt has this night and this morning evacuated Ratisbon to move on Neustadt and to join with the Bavarians. *I therefore expect an engagement to-day;* * however it is midday and the cannon have not yet made themselves heard. *You see that, by this manœuvre, I am refusing my left, wishing to advance my right which you form and which, from to-day, commences to enter into the game.** This evening or to-morrow they will perhaps be fighting on the left.

*Push Oudinot's corps on Au and on Freising.** Push posts on Munich to learn what is there. The inhabitants of the country being for us, you can send estafettes everywhere.

From Freising and Au, according to the information that I shall receive to-day, *I shall direct you on Landshut; and then Prince Charles will find that he has lost his line of operations, his protection*—which is the Isan— *and will be attacked by his left.**

I tell you to carry a division to Au and not all on Freising, because if the left were engaged more than I desire, the division which will be at Au will have made a march to succor the left.

All this should be elucidated to-day and *the movements are precious.** Keep Oudinot's corps disposable and place your four divisions around Pfaffenhofen, on the three directions of Neustadt, Freising and Au, so that, according to circumstances, one of them marches first and directs the columns on the point where they must march. *Here all is a calculation of hours.** However, the 12,000 or 15,000 of this rabble which you have beaten this morning ought to be attacked, head down, by 6,000 of our people."†

At 1 P. M. to the *duplicata* of this order was added this postscript.

"P.S. Instead of placing one of Oudinot's divisions at Au, as was said in the *primata* which has just been sent you by an orderly officer, you will place this division on Neustadt, in order that it may gain a march to support the left, and the other division, you will place it as is said before, on Freising."‡

The Emperor then mounted and hurried forward to Abensberg.

The principal interest of the day is concentrated in the narrow territory enclosed in the quadrilateral Landshut-Ratisbon-Neustadt-Au. Davout had, as we have seen, massed his divisions south of Ratisbon at 8 o'clock P. M. on the 18th preparatory to retreating to Neustadt and "all dispositions were made to assure this flank march which the presence of the whole enemy's whole army rendered extremely delicate." § The road

* The italics are ours.

† Napoleon, Corresp. 15,092. Vol. 18. p. 487.

‡ *Ibid.* pp. 487–488. Compare Pelet, tome 2, pp. 407–409.

§ Davout's report.

along the Danube was kept free for the baggage, and the 65th regiment (3 battalions, 1800 men) left under Colonel Coutard to guard the bridge at Ratisbon until the retreat had been accomplished. The advance-guard under Montbrun—composed of the light cavalry of Pajol and Jacquinot with 2 battalions of the 17th Light Infantry—was directed south through Eckmühl to Dinzling to cover the movement and then to regain Abensberg by the cross-roads. The infantry moved in two columns—the first (the divisions of Gudin and Friant) on the left through Weillohe, Saalhaupt and Oder Feking, and the second (Morand and St. Hilaire) on the right through Gebraching, Peising, Teugen and Feking—preceded by the rest of the light cavalry and St. Sulpice's cuirassier division. The retreat began about midnight and at 6 A. M. St. Sulpice, Gudin and Morand had reached the plateau before Ober-Saal without opposition, but at 9 o'clock the Austrians were encountered between Teugen and Hausen. Gudin, Morand, St. Sulpice and the baggage train were ordered to continue on without stopping to fight and to effect their junction with the Bavarians, while St. Hilaire, Friant, and Montbrun remained behind to oppose the Austrian advance and insure the union.

On the morning of the 19th, the Austrian army began its inexplicable and fatal march on Ratisbon, thus renouncing the advantages which had laid within its very grasp and inviting Napoleon to break its own centre and defeat the corps in detail—an invitation which he accepted with greatest alacrity to the subsequent utter discomfiture of the Archduke.*

At 6 o'clock—when Davout had half completed his retreat to the Abens—the 92,000 Austrians, who could so easily have overwhelmed the Bavarians on the previous day (Tuesday), commenced their movement northward on Ratisbon. The army was divided as usual into 3 columns; on the left the Third corps (25,000 men) advanced from Rohr and Bachl through Thann, Hausen and Teugen, where it separated to attack Abbach by Deutschhof and Peising, a detachment of 6000 under Thierry being sent to the heights before Abensberg to observe this debouche and assure touch with the Fifth corps. In the centre

* "To change strategical plans when not forced to by circumstances leads to disaster." Hohenlohe-Ingelfingen, Letters on Strategy. 5th axiom, p. 101.

the Fourth corps (Rosenberg) and the 12 grenadier battalions of the First Reserve corps (28,300) moved from Rohr through Langquaid on Dinzling and Weillohe; while on the right Lindenau's division (Fifth corps) and the cuirassiers of the First Reserve corps (20,000) under Lichtenstein were directed through Langquaid, Schierling, Eckmühl and Egglofsheim. The troops comprised in this movement amounted to 73,000 as compared with Davout's 46,000, but it was, of course, absolutely necessary to leave a body to observe and contain the Bavarians during this flank march to the north. The Fifth corps (Archduke Louis) was accordingly left with 14,000 men opposite Siegenburg, supported by the Second Reserve corps (Kienmayer) at Pfeffenhausen. Mesko's brigade had been sent on the 18th to Mainburg* and these forces were further augmented by the Sixth corps coming up from Au and Luzmannsdorf (south of Pfeffenhausen), of all of which Hiller was to assume supreme command and his instructions were, to retreat, if necessary, through Landshut.† On the left bank of the Danube, Kollowrath at Stadt-am-hof was about to attack Ratisbon while Bellegarde was moving from Amberg on Neumarkt *en route* to Ratisbon. It will therefore be observed that *the Archduke, whose forces had been so admirably concentrated on the 18th, threw his inestimable advantages to the wind by making this foolish movement of division while Napoleon was making every effort to concentrate.* The retreat of Davout parallel to the Danube and the advance of the Archduke were such that, while the heads of their columns continued on, the rear divisions on the inner flanks necessarily encountered. The skirmishers of the Austrian column of the centre met the French patrols near Schneidhardt and attacked, but the Archduke halted Rosenberg's troops on the heights of Grub to await the arrival of Hohenzollern's column (of the left) which after a long delay debouched through Thann moving on Hausen. About 9 A. M. Davout near Saalhaupt was informed of the Austrian approach and promptly posted St. Hilaire on the heights of Teugen and at Hausen and

* The Austrian front from Eckmühl to Mainburg and the French front from Ratisbon to Neustadt occupied very nearly the same extent. Vide Hamley, p. 151

† Notice how the Austrian left would thereby be refused during the forward movement of the right and centre.

as Friant's regiments came up they were placed on the left. Morand, Gudin, and Saint-Sulpice had at that hour got past Feking and the Saal-bach and near Arnhofen had united with the Bavarian divisions established at Mühlbach, Biburg and Neustadt, thus forming part of the French line extending from Teugen to Siegenburg. The advantage of position was all on the side of the French who occupied a gentle height covered with woods and susceptible of easy intercommunication between the various parts. At 11 o'clock the action became general and the equality of numbers engaged led to a desperate fight, in which Hohenzollern and Davout lost heavily. For some entirely unexplained reason the Archduke failed to bring into action all the troops at his immediate disposition* and again lost the opportunity to crush Davout's slender forces which held their ground with remarkable firmness until a terrific thunder storm put an end to this battle of Thann at 6 P. M.

On the extreme Austrian right Lichtenstein, after a slight skirmish with Montbrun†, had pursued his march through Eckmühl to Egglofsheim and Lukepoint in total ignorance of the course of the battle to the west. In the centre Thierry (Hohenzollern's corps) had left Rohr at 6 A. M. and moved with his 6000 troops through Kirchdorf on Arnhofen where he endeavored to prevent the union of the divisions from Ratisbon with Lefébvre, but at 4 P. M., after having been charged by the Bavarian cavalry, attacked in front by Morand and threatened on his right by Wrede, was forced to retrograde beyond Offenstetten, which the Bavarians, supported by Morand and Gudin, promptly occupied, and *this advance served as the entering wedge which subsequently separated the Austrian left from its centre.* The Archduke Louis, left to contain the Bavarians, had become so anxious over the heavy firing heard in the direction of Abensberg that he sent General Bianchy with a brigade to support Thierry and upon reaching Biburg the former learned

* "The first principle of war is that one ought not to deliver battle except with all the troops which one can unite on the field of operations." Napoleon, Précis des guerres de Frédéric II. 24th observation. Corresp. vol. 32, p. 227.

† "The advance-guard had encountered the enemy at Lukepoint and had driven it as far as Dinzling. It maintained itself in this position until evening, but, destitute of artillery and the enemy having at the end of the day established eighteen pieces in battery against it, it retired to Peising without being attacked." Davout's report.

of Thierry's defeat and was himself opposed by Wrede, but a vigorous artillery duel lasting until darkness found each one stubbornly holding his ground.

On the Austrian left the scales of Fortune had likewise changed. At 6 A. M. Masséna, who had spent the night at Schrobenhausen, reached Pfaffenhofen at the head of Oudinot's divisions, attacked and routed Scheibler's corps and drove it back vigorously on Au, thereby overawing Hiller, who did not dare until evening to continue his movement from Au on Mainburg to support the Archduke Louis lest he should be attacked in the rear while on the march. Oudinot was pushed forward along the road to Freising, but Masséna was himself compelled to await his rearmost divisions which rejoined him that night at Pfaffenhofen. Although Masséna did not actually "get into the game" that day, he formed the marching wing which threatened and ultimately cut the Austrian line of communications through Landshut.

After the battle of Thann in which the Austrians lost 2994 killed and wounded * and 700 prisoners † and the general officers greatly distinguished themselves,‡ the Archduke's corps occupied the following positions: Lichtenstein near Egglofsheim, Rosenberg before Dinzling, Hohenzollern behind Hausen, with Pfanzetter's detachment at Bachl. The grenadiers of the First Reserve corps (Lichtenstein) on the heights of Grub, Thierry behind Offenstetten, Bianchi near Biburg, the Fifth corps (Archduke Louis) facing Siegenburg, the Sixth (Hiller) at Mainburg, and Kienmayer at Luzmannsdorf. Louis, upon hearing of Thierry's defeat, had sent Schustek with 4 squadrons of Kienmayer's corps to Rohr to cover this important point and preserve the touch with the centre, but the Archduke found himself totally unable to obey the order which he received that evening.§ Lichtenstein was ordered to retire across the Grosse

* Oesterreichs Kriege seit 1495, p. 106.

† Davout (Teugen, April 20th, 5 P. M.) to Napoleon. Davout, Corresp. Vol. II., p. 482.

‡ The Princes Lusignan, Louis and Moritz von Lichtenstein were wounded.

§ At 3 P. M. the Archduke Charles, on the heights of Grub, had written his brother that "having encountered the enemy he is strongly engaged, and that it is announced that Marshal Davout wants to attack on all points, that the Fifth corps should march during the night by Rohr and Langquaid to support him, if, however, he did not fear for himself before Siegenburg, where General Hiller should replace him as early as possible." Pelet, tome I, p. 303.

Laber through Leierndorf, which he did that night instead of approaching Kollowrath at Stadt-am-hof, and Bellegarde advancing from Amberg.

That night Marshal Davout with the divisions of Friant and Saint-Hilaire bivouaced on the heights of Teugen and Peising in possesssion of the battle-field where they were joined by Montbrun;* Morand, Gudin and Saint-Sulpice were posted on the hills of Arnhofen. Marshal Lefébvre occupied Offenstetten and Biburg supported by Vandamme and Nansouty at Neustadt. On the right Masséna occupied Pfaffenhofen, preceded by Oudinot on the road to Freising and his cavalry on all the roads to Munich, and effectually cut Jellachich off from the Archduke. The French army thus occupied a line about 21 miles in extent but entirely unbroken and so placed that in a few hours it could be concentrated on any given point. The two principal masses were assembled opposite the Austrian centre and left and already threatened to separate and interpose between them.

That night the Austrian line from Amberg to Mainburg was triple the extent of the French line. Davout had completely blocked and now threatened the advance on Ratisbon, and *between Archduke's centre and right existed a dangerous opening of nearly 13 miles* † just at the place where the French columns from Ratisbon and Ingolstadt would necessarily meet, *and the line of the operations from Landshut on Kelheim*, for which he had sacrificed so many days, *was therefore quite uncovered.* ‡ This line from Landshut,—where he had just established his new base—through Braunau and Linz meets the true line of operations from southern Germany through Augsburg and was already menaced by Masséna's advance. The fatal result of the change of direction from Neustadt to Ratisbon and Napoleon's remarkable strategic foresight now become apparent. § "When the Archduke on the 19th advanced on Ratis-

* Vide Davout, Corresp. Vol. II, pp. 481-482.

† "Never separate the wings of your army, one from the other, in such a way that your enemy can place himself in the intervals" Napoleon, Précis des guerres de Frederic II. 11th observation. Corresp. Vol. 32, p. 196.

‡ "Preserve with care and never abandon with a light heart your line of operations." *Ibid* Quelques, considerations sur la guerre de Sept. Ans. II, p. 240.

§ "If there was one distinguishing feature of Napoleon's system of war it was that of so manœuvring as to divide the forces of the enemy and then to defeat them in detail." Sargent, Campaign of Marengo, p. 131.

bon to attack Davout, he was obliged to leave a strong force on the Abens, for he knew that a great part of Napoleon's army was collected on the other bank; and had he withdrawn his *whole* force toward Ratisbon the enemy from Abensberg would have cut him from the line Landshut-Braunau by the single march on Rottenburg. Hence he could only perform the movement by dividing his army. But while he was making a movement of separation, Napoleon was making one of concentration;" * Davout had effected his junction with the centre and thenceforth the continuity of the French line remained intact. The Archduke's golden opportunity vanished with the sun of the 19th and on the following day the Austrians found themselves disunited, separated, and beaten in detail. †

Late in the afternoon Napoleon had arrived on the line of the Abens where he thoroughly examined the position, paying especial attention to the debouches onto the plateau of the Rohr, and determined to make his decisive movement next day on this point; ‡ he then returned to Vohburg where his headquarters had been established. The exact *status quo* of the Austrian army became manifest as the reports poured in to the Imperial headquarters during the night and he resolved to complete the separation of the left from the centre, to destroy Hiller, to occupy Landshut with its immense depots, and by seizing the Archduke's line of communications, to open the road to Vienna. While Davout contained the Austrian right and centre he purposed to draw in reinforcements, to pierce by Kelheim-Landshut—(instead of augmenting the movement of Masséna against the extreme right which would necessarily throw Hiller onto the Archduke)—and, uniting his forces at Landshut, to crush the main army in the *cul-de-sac* formed by the Inn and the Danube. Orders were accordingly issued to Davout at Teugen to manœuvre against the Archduke "in such a way as to make him uneasy and contain him in his po-

* Hamley, p. 151.

† "One must keep the army united, concentrate the greatest forces possible on the field of battle, profit by every occasion, for Fortune is a woman; if you miss her to day do not expect to find her again to-morrow." Napoleon, Notes sur l'Art de la Guerre. 40th conclusion. Corresp. vol. 31, p. 418.

‡ "The fundamental principle upon which every military combination rests is to operate with the greatest mass of our forces, a combined effort, upon a decisive point." Jomini, Grand Military Operations, Vol. 2, p. 448.

sitions on both banks of the Laber, leaving Saint-Sulpice's division in front of the defiles of Post-Saal to guard them and to connect Davout's troops with those of which he would himself conduct." Lefébvre was directed "to debouch and to second the dispositions of the Third corps" and at midnight Masséna was informed that "A general engagement has taken place between Prince Charles and the Bavarians. The Austrians have suffered considerably. *The Emperor desires in this position for you to manœuvre to a double end by sending reinforcements on Abensberg by one or the other of the roads and by marching on Landshut.* The Emperor is at Vohburg." *

At 3 A. M. a second order was despatched by Berthier to Masséna:—

"*The Emperor*, monsieur le duc de Rivoli, *orders you to have the corps of General Oudinot ascend either by Au or by Geisenfeld, to concert in his operations with the left of the army and to aid it.* Consequently he should hasten his march if he hears the cannonade. With your corps and Espagne's division, mons. le duc, the intention of the Emperor is that *you will direct yourself on Freising and even on Moosburg;* therefore you should pass through Au, after having assured yourself that nothing can bother you from Freising. *From Freising you will try to get possession of Moosburg or of the bridge on the Isar*, for if the enemy succeeds in gaining Landshut he will want to defend the passage of the Isar. *It will therefore be good*, monsieur le duc, *that you should unite with the army which will attack Landshut to offer it a bridge over the Isar.* However, one will see during the day what the enemy will take. Have the march which General Oudinot will follow well understood. It is probable that this movement will force the enemy to evacuate Munich, to retreat; and according to the information which you will receive about the enemy, you will attack him. His Majesty however, relies on you for what cannot be forseen in an expedition of this nature.

(Signed) ALEXANDER." †

At 6.30 A. M. he wrote to Vandamme:—

"You are at Neustadt. You have troops at Mühlhausen and near Siegenburg. *Carry yourself to Siegenburg with all your forces; take under your orders all the Wurtembergers.* The officer carrying this letter will in passing give the order to the Wurtemberg brigadier general, who is in reserve, to move to Siegenburg. I am mounting my horse to proceed to the advance posts, where I shall myself direct the movements. You will debouch through Siegenburg with all the Wurtembergers." ‡

At the same time another despatch was sent to Masséna at Freising:—

"All this morning's reports are that the enemy is retreating as fast

* Pelet, tome 2, p. 410. The italics are ours.

† Pelet, tome 2, pp. 410–411. The italics are ours.

‡ Napoleon Corresp. 15,097. Vol. 18, p 490. The italics are ours.

as he can. The battle-field is covered with his dead. The divisions of Friant and Saint-Hilaire—and a Bavarian division alone were engaged.

I am mounting horse to go myself to reconnoitre the condition of things at the advanced posts, to attack the enemy, if he still occupies several positions, and to pursue him closely if he retreats. *I beg you on your side not to lose a moment and to surprise him at the crossing of the Isar.*

P. S. *The more you will approach Landshut the better that will be.* No doubt that, if you might go to Landshut that would be preferable, but try to go to Moosburg."*

Napoleon then rode forward to the Abens to complete his examination of the terrain and to direct the concentration of his forces for the battle destined to cut the Austrian army into two. Since the war had been brought about largely on account of the imperilled interests of the Confederation of the Rhine, Napoleon had resolved to give the Allied troops the greatest proof of his confidence by placing them in the centre under his immediate command and as the Bavarians, followed by the Wurtembergers, moved into position on the Abens, Napoleon halted and addressed to them one of those marvelous allocutions with which he knew so well how to arouse enthusiasm to its utmost pitch.† The French line when formed extended thus:—Davout with the divisions of Montbrun, Friant and Saint-Hilaire from Peising to Teugen, Saint-Sulpice at the defiles of Post-Saal to preserve connection with the remainder of his corps, (Gudin and Morand) under the command of Marshal Lannes, who had just arrived, *à cheval* on the road from Kelheim to Landshut, Vandamme with the Wurtembergers in the centre and Lefébvre with the Bavarians prolonging the line beyond to Siegenburg. At 9 o'clock the general advance on Rottenburg was begun, with the exception of Wrede on the extreme right reëstablishing the bridge at Siegenburg under fire from the Archduke Louis' batteries. Lannes on the left penetrated through Rohr toward the Kleine Laber, driving Thierry from Bachl onto Schusteck at Rohr, and throwing both into confusion rolled them back early in the day on Rottenburg, thereby severing communication with the bulk of the Archduke's forces and cutting off all support from that direction, thus forming the most advanced echelon of the attack. In the centre Napoleon himself directed the Wurtembergers through

* Ibid 15,098, p. 490. The italics are ours. Also Pelet, tome 2, p. 410.
† Vide his Corresp. 15,099. Vol. 18. p. 491.

Offenstetten on Rohr and the Bavarians through Pruck on Kirchdorf, but their advance was opposed with great vigor by Bianchi opposite Biburg, supported by the Prince Reuss' division (Fifth corps). Both sides fought with utmost desperation, and the Emperor was careful to keep up the action until some time after Lannes had occupied Rohr and reached the Grosse Laber, thus occupying the road to Rottenburg and barring the retreat of the Fifth corps toward the Archduke Charles. On the extreme right Wrede was kept refused, and the completion of the bridge at Siegenburg under fire was not accomplished until 2 P. M., when Wrede crossed and advanced toward Pfeffenhausen, thereby threatening the Archduke Louis' line of retreat and compelling him to retire his entire corps through the defile leading to that point by the only road then open to him.*

Meanwhile at 8 A. M. Hiller at the head of his column received at Nieder-Hornbach news of the fighting of the previous day on the Austrian right and halting his corps proceeded in person toward Siegenburg where he observed the French preparations for attack on the side of Abensberg and learned that the road to Rohr was thereby threatened. He accordingly sent Vincent (3d division) to Rohr and resumed his own advance on Rottenburg where he met the débris of Thierry and Schusteck flying before the Bavarians, but in spite of the stubborn defense of Weissenvolf's brigade he arrived too late to occupy the bridge and the marshes of the Grosse Laber where he might possibly have checked any further advance. He therefore masked his movement with great skill and retreated with Kienmayer to Turkenfeld, where he spent part of the night and later continued on to Landshut.†

At Rottenburg despite the approaching darkness another desperate fight took place and Napoleon to prevent the union of the Austrian corps ordered Wrede to drive the Archduke Louis' rear guard (Radetzki) through the defile of Pfeffen-

* Observe the manner in which the French columns were kept in touch with each other and the careful observance of the rule "that a wing must be turned or outflanked, without separating the army." Napoleon, Précis des guerres de Frédéric II. 23d observation. Corresp. vol. 32, p. 221.

† Although both banks of the Laber were unoccupied by the French until nearly nightfall, it appears that neither Hiller nor the Archduke Louis knew that the headquarters were at Egglofsheim. Vide Pelet, tome 2, p. 24.

hausen and attack it during the passage of the Gross-Laber. The Bavarians executed this order with remarkable vigor and succeeded in throwing Radetzki into such confusion that he was unable to burn the bridge to cover Louis' retreat on Landshut. On the left Lannes' flankers had attacked near Langquaid the posts of the Third Austrian corps and forced Hohenzollern to send them aid by posting Pfanzelter to occupy Langquaid, but the French crossed the Grosse Laber and spreading out compelled Hohenzollern to hurry his park and baggage through Eckmühl on Ratisbon. This movement also connected Davout's advanced posts with the centre, obliged the Archduke Charles to employ his extreme left and severed his communication with his left wing.

On the extreme right of the "Grand Army" Masséna in obedience to orders, sent Oudinot with Boudet's division which formed the tail of his column on Abensberg * and himself made a forced march to Freising where he arrived early in the day with his light cavalry, Legrand and Claparède. He at once repaired to bridge destroyed previously by Lefébvre and sent the Baden dragoons toward Moosburg. On the extreme left Davout played the rôle of containing force which contributed much to the success of the day. The check which the Austrian advance had encountered on the previous day made it doubly imperative for the Archduke to get possession of Ratisbon in order to effect a junction with Kollowrath at Stadt-am-hof and with Bellegarde approaching from Neumarkt. This corps was accordingly pushed forward on Ratisbon *where the 65th regiment*,—there left on the 18th by Davout,—*kept the entire army at bay until 6 o'clock when it capitulated.* Davout's 3 divisions on the heights from Peising to Teugen necessarily came into contact with Hohenzollern's column which formed the left of the Austrian advance and had after fighting all day driven Vukassovich's division—which had replaced the grenadier reserves withdrawn at dawn by the Archduke—supported by troops posted at Ditenhofen, from Hausen back on Leierndorf. Davout was supported by Saint-Sulpice in reserve near Ober-Saal and by Demont's division at Vohburg, and, with his communi-

* Tharreau's division had already been directed on Neustadt where it arrived that night.

cation with the centre assured by Lannes' flanking detachments, he was therefore enabled to hold his positions all day.

Such was the battle of Abensberg, in which Napoleon, profiting at once by the void left in the centre of Austrian front by the march of the 19th, had concentrated his forces, driven back Hiller, Louis, and Kienmayer, and completed the separation of the Austrian left wing* from the centre, while Davout by containing the Archduke prevented the union of the enemy's parts. "While Napoleon was defeating the left wing, Davout was left in front of a very superior enemy ;† and that it would seem at first as if an attack upon him would have balanced the fortunes of the day. But Davout, if compelled to retreat, would have approached Napoleon, whereas the Austrian left wing, when defeated, was receding from the Archduke Charles. The result of the Archduke pressing back the force in front of him would have been that the main French army, supporting Davout, would have fought on the 20th or 21st the battle of the 22d without the trouble of going to seek the enemy."‡ Moreover, since Masséna was beyond the sphere of action on that day, the sum total of the armies actually in the presence of each other was greatly in favor of the Archduke by about 134,000§ to 104,000, *but Napoleon's remarkable skill in determining the most decisive point and in concentrating for the battle had made him superior to the forces actually opposed to him that day by 80,000 to 70,000. The immensurable advantage of interior lines had shifted in two days from the Austrians to the French and Napoleon's use of them* || *contrasts strongly with the Archduke's failure to employ them at the very moment when success lay within his grasp* and in the subsequent operations we shall "get something like an approximate idea of the actual equivalent in force of the advantage possessed by the army whose action is concentric over that which is divided."¶

* The Austrian left wing lost 25 officers and 467 men killed ; 63 officers and 2156 men wounded ; and 4000 prisoners. Oesterreichs Kriege seit 1495, p. 106.

† Davout had only 24,000 men as opposed to the Archduke's 91,000.

‡ Hamley, p. 151.

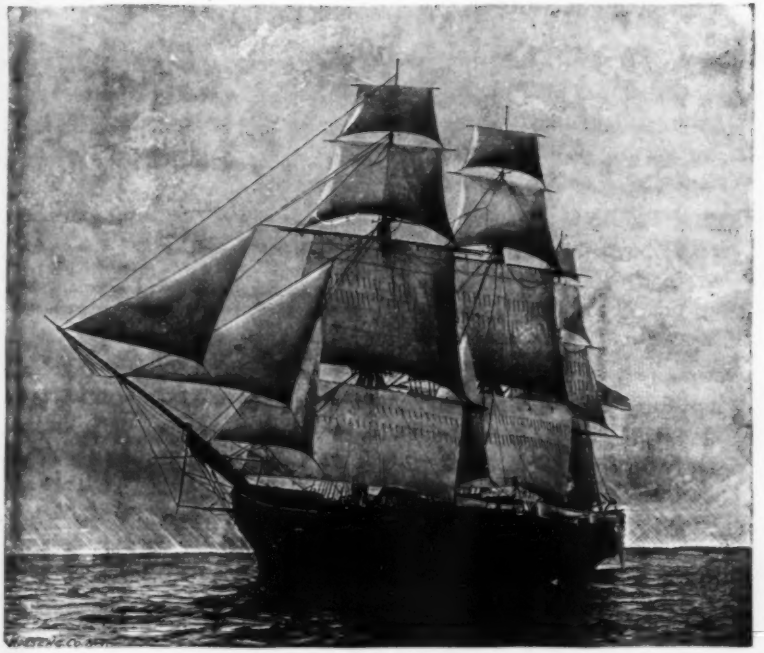
§ Not including Bellegarde (27,800) or Jellachich (10,971).

|| Observe how Napoleon realized their full value (1) by acting constantly on the offensive and in force ; and (2) by taking the offensive upon only one point at a time. Compare Derrécagaix, Modern War (Strategy), p. 270.

¶ Hamley, p. 152.

The French army that night occupied the following positions:—Davout from Peising to Teugen, Saint-Sulpice and Demont before Vohburg; Lannes between Rottenburg and Ascholzhausen, Vandamme between Rohr and Pfeffenhausen; Lefébvre along the Grosse Laber to Pfeffenhausen, Masséna at Freising, Oudinot near Abensberg, and the Imperial headquarters at Rohr—the three principal masses (Davout, the Emperor and Masséna) in perfect intercommunication while of the Austrian army, Bellegarde had reached Neumarkt and Beilngries, and Kollowrath, disengaged at 6 P. M. by the surrender of Davout's regiment, had been ordered and had begun his movement from Stadt-am-hof to Beilngries. On the left bank Lichtenstein retrograded from Ratisbon toward Volkering, Rosenberg camped at Dinzling, Hohenzollern occupied Leierndorf and the grenadiers of the 1st Reserve Corps between Hoheberg and Egglofsheim, where the Archduke's headquarters were, while the entire left wing (Archduke Louis, Hiller and Kienmayer) was in full retreat from Rottenberg and Pfeffenhausen on Landshut.

(TO BE CONTINUED.)



U. S. SLOOP OF WAR "PORTSMOUTH"

The U. S. S. *Portsmouth* was built at Portsmouth, N. H., in 1843. She carried 22 guns and 210 men; 1022 tons displacement; length 151.10 feet; beam 38.1; hold 17.2; and cost $170,586.

Very respectfully
Your Obt Servt
J. B. Montgomery
Commodore & Pres.
U.S. Ship Portsmouth

THE NAVY ON THE PACIFIC COAST, 1845-47.

FROM A PRIVATE RECORD.

THE following extracts from the private Journal of Commander (the late Rear Admiral) John Berrien Montgomery, U. S. Navy, commanding U. S. Sloop of War "Portsmouth," 1844-48, relate to the Mexican War and the acquisition of California, and turn a side-light upon that period in our National history.* It will be seen that the blockade of Mazatlan shed new lustre upon our Navy and one of its most gallant and yet discreet officers, whose personal prejudices (as in the California affair) did not cause him to deviate a hair's breadth from the line of his duty.

I.

CALIFORNIA.

Monterey (*Cal.*). Sept. 28, 1845. "Sent a boat with Lieut. Bartlett to wait on the Consul, Mr. Larkin, who returned in the boat. Learned from him that American interests were perfectly secure, and little probability of their being interrupted in any way unless by a war with Mexico, which Mr. L. seemed to regard as a probable event, growing out of the Texas question, in which he said that a Sloop of War would be greatly needed at Monterey, to protect from seizure whaling and trading vessels calling there. He further informed me that by a vessel from Acapulco information had been brought of

* *John Berrien Montgomery*, b. Allentown, N. J., Nov., 1794; d. Carlisle, Penna., March 25, 1873. Midshipman U. S. Navy. 1812; served under Perry, receiving a sword of honor at close of War, 1814, and with Decatur in 1815. Lieutenant, 1818, and on the African and Mediterranean stations until 1835, when he became Executive Officer of the "Constitution." Commander, 1839, and assigned (1840) to command new Sloop-of-War "Portsmouth;" subsequently taking possession of and establishing the flag of the United States at San Francisco, Sonoma, New Helvetia, and maintaining the blockade of Mazatlan, Mex. In October, 1847, in company with the U. S. S. "Congress," bombarded and captured the fortified town of Guaymas, Cal. In April, 1848, hoisted the first U. S flags at Cape S. Lucas, San José and La Paz, which forts were held until the close of the War His name was given to one of the principal streets and that of his ship to a square in the City of San Francisco. His admirable conduct of the blockade of Mazatlan gained him the thanks of the British government. Captain, 1853, and in 1857 assigned to command the new steam frigate "Roanoke;" in 1859, to the command of the Pacific station with the U. S. Corvette "Lancaster" as flagship. In charge of Boston yard, 1862, and Washington yard, 1863-65. Rear Admiral, 1866, and at own request on waiting orders, September 1, 1869.

the arrival of 2000 Mexican troops at that port, destined for the immediate occupation of California, to be paid by English individuals, under the sanction and countenance of the British government; in proof of which he had seen a letter from Mr. Barron, the English Consul at St. Blas, stating the fact and that he was to be their Paymaster. The said troops are very soon expected to arrive here." * * *

"In a second interview with our Consul, Mr. Larkin, I was corrected in the matter of the letter from Mr. Barron, said (in my remarks above) to have been seen by him. There is, however, sufficient reason to believe that the troops intended for California are to be paid with English funds through Mr. Barron, from letters which have been received by English residents in Monterey."

Mazatlan (*Mex.*) Oct. 16, 1845. "Visited by a Mexican officer from shore with the Governor's compliments and congratulations on my arrival, etc. Sent my First Lieutenant to wait on the Consul, Mr. Parrott, who returned with information of the annexation and occupation of Texas by the United States; of the perfect quietude of Texas under this proceeding; that it was believed no war or difficulty would accrue from the event, and that American interests, etc. were secured. In the morning visited by the Consul to breakfast; at 9 A. M. saluted the Mexican Flag and government with twenty-one guns, which are promptly returned, and afterwards gave nine guns to our Consul on leaving the ship; at half past ten accompanied the Consul to visit the Governor (General Facia), who was very civil, expressing his regret that I intended leaving so soon, etc., a very pleasant interview." * * *

Acapulco. Oct. 29, 1845. "Intelligence from Mexico, per last mail, altogether of a pacific character, and the prevalent impression on shore that there will be no hostilities with the United States. Five vessels in port awaiting the arrival of troops intended for California, a corps of artificers and several officers (subordinates) to make arrangements, etc., being all of the expedition yet arrived. The vessels having waited already two months, leads to the conclusion that the expedition, through the supineness of the government and want of funds, will wholly fall through; this is my impression. The belief is prevalent that California is prepared and determined to resist the introduction of Mexican troops."

Guaymas (*Mex.*) Dec. 2, 1845. "A revolutionary movement of a local and personal character, having for its object the removal or destruction of an obnoxious individual (General Urea) from the provinces, was terminated on the —— inst. by a decisive conflict between the parties at ——— in which Urea's party was overcome and put to flight with considerable loss of life on both sides—the government still continued in its legitimate hands, no change therein being desired or attempted by the triumphant party, whose course

had been directed strictly in consonance with views and wishes of the Mexican government, which had previously given orders for the apprehension and expulsion of Urea." * * *

Monterey (Cal.) April 23, 1846. "Lieut. Bartlett returned from the shore with information that our Consul, Mr. Larkin, would visit the ship, that the commercial and other interests of the United States continued safe, having experienced no interruption or annoyance since our visit in October last. Captain Fremont with his company (occupying in March last) a position twenty-five miles distant from Monterey, having accomplished his purpose of survey, etc. etc., had deliberately withdrawn his company to the Sacramento, where he is now supposed to be. A body of two hundred troops was directed by the Military Governor of Monterey to proceed and dislodge Captain Fremont from his position, and to drive him out of the provinces; and having approached to within ten miles of the American encampment, they were content to remain there until intelligence of Captain Fremont's retrograde march was brought to them, when they returned to Monterey, leaving Captain Fremont and his little band to proceed in any direction and occupy any position which should best suit their purpose and convenience in the provinces. It is here well understood that no real attack upon the camp of Captain Fremont was contemplated by General Castro when he directed this movement, but that it was done with the view only of furnishing materials for forming a high sounding, flaming despatch to the central government of Mexico." * * *

"Mr. Larkin informed me that the unsettled condition of California since the expulsion of Michelleranie from the province, seems to point to a necessity, and naturally produces in the public mind an expectation of a speedy political change of some kind; and that the feeling is rife, that California is soon to be governed by England or the United States; predilections being divided, owing, Mr. Larkin thinks, to the ignorance of the native and Mexican population respecting the nature and extent of colonial privileges under the former government, but that a change under either would probably be acceptable to them, while the foreign population, including those from the United States, would be found nearly united in our favor, some few perhaps (having large local interest at stake) might remain neutral through fear of Mexican resentment, the brief occupancy of Commodore Jones having taught the necessity of caution. In the event of war with Mexico, it is thought that no opposition would be offered to hoisting the flag of the United States either here or at San Francisco, and that such an occurrence would at once unite from five hundred to one thousand sturdy American and other foreign residents to sustain our banner."

April 28, 1846. "This day informed that General Castro was preparing to move with the military, about thirty in all, to the interior, taking

a position near Puebla between this and San Francisco, with a view of awaiting the result of existing difficulties between the United States and Mexico, conscious, it is said, of utter inability to oppose any attempt on our part to take possession of either or all the ports upon the coast. Also informed that the Commandant General had sent to enquire of Mr. Larkin why two officers of the Portsmouth, Lieut. Bartlett and Lieut. Watson of Marines, had proceeded to visit the quicksilver mines, recently discovered near St. Clara, without obtaining passports; to which Mr. Larkin replied that he had not deemed it necessary to apply for passports for American officers, in circumstances where it had in no instance been deemed necessary to obtain them for English or other foreign officers at Monterey. This answer appeared satisfactory, as nothing more has been said on the subject." * * *

April 29, 1846. "I am informed by the Consul that General Castro is troubled with suspicions of collusion between Captain Fremont and myself, and supposes that I have sent for him to return to Monterey, which is inferred from Castro's enquiring of the Consul whether Captain Fremont was coming with his company or alone, to which the Consul replied that he was not aware of his coming at all." * * *

May 1, 1846. "At 11 A. M. went on shore by invitation of the Consul to witness the process of drawing quicksilver from a quantity of ore brought from a recently discovered mine near St, Clara, seventy miles from Monterey to the northward." * * *

"Lead, sulphur, copper, iron and coal have been recently found in Upper California in considerable quantities, the two first specimens of which I have seen as taken from the mines in a perfectly pure and unadulterated state and ready for use. Silver and gold are also found, and there is sufficient reason to believe the latter may yet be found in great quantities; and as the soil of the country is exceedingly rich, running to a great depth, and the climate embraced between the latitudes of ——— and favorable for the cultivation of the bread stuffs and products generally of the United States, as well as those of the tropics, it is reasonable to infer that at some time not far distant, when this country shall have been settled by a more enterprising and industrious class of people than her present population, that California will justly be regarded as one of the richest districts of country in the Universe. I was credibly informed yesterday by a Californian of high and respectable standing, who is one of the most extensive land and cattle holders in the country, that he had known wheat to yield two hundred per cent. for the quantity sown; one hundred per cent. yield is not unfrequent." * * *

May 4, 1846. "Lts. Bartlett and Wilson returned from Puebla much pleased with their excursion, of five days, from the ship. They

give a most glowing description of the beauty and fertility of the country through an extent of two hundred miles over which they traveled, returning by a different route from the one by which they proceeded. Valleys said to extend to the snowy mountains and several miles wide, covered with a spontaneous growth of wild oats, rich grapes and flowers, affording sustenance to thousands of wild horses and cattle, fine forests of oak, pine, red cedar and various other trees of larger size than the timber growth of the United States, and running up without a crook or limb to the height of from a hundred to two hundred feet. The residents of the district through which they passed are represented as principally from the United States, who, with many of the most intelligent Mexicans and Californians, express openly their desire for and expectation of a change of government which shall unite them to the United States. They look confidently to this event as that which is to consummate their interests and happiness, and openly and fearlessly speak of it as one which is near at hand; and it is not unlikely, I think, from all the indications of the times, growing out of the evil of an inefficient and unfaithful government, with the continually increasing preponderance of the Anglo-American population of the country, that the emigration from the East during the current year (armed and equipped as they all are for defense) will greatly increase and embolden the spirit of disaffection now so prevalent, and amply supply material for its indulgence." * * *

May 9, 1846. "Rode ten miles into the country in company with sixty persons, male and female, mounted on horseback to a picnic, by invitation of General Castro, the Commandant General of California. Seven of the officers of the ship were of the party. On our return visited the Mission house and convent of Carmello (or Carmel) now deserted and in a dilapidated condition, as are the numerous Mission houses and establishments which line the shores of California. Their extensive domain of from ten to twenty leagues square, each having been disposed of in portions to suit purchasers, are being now offered for sale at exceedingly low prices, a beautiful fertile valley through which we passed, producing in the richest luxuriance, wild oats, nutritious grapes, and wild flowers of great variety of kinds and colors, which I was informed could be purchased of its Indian proprietor for about one hundred dollars for two square leagues.

May 11, 1846. "Informed that General Castro had received information from Puebla that Captain Fremont was about to move towards Monterey at the head of three hundred men, which produced considerable stir and excitement. Troops were seen (about twenty-five in number) moving from the town; informed that their destination is Puebla, but little dependence can be placed in any reports circulated in Monterey, as the Commandant General, it is said, has

revolutionary schemes in contemplation, for the prosecution of which it is most probable the above and similar reports have been fabricated." * * *

May 15, 1846. "A ball given on shore by the wardroom officers of the ship to the inhabitants of Monterey, which was very numerously attended. Among the guests were the Commandant General Castro, with all the principal officers of government and their ladies. It passed off very satisfactorily, seemingly, as the dance was continued until daybreak, I am informed." * * *

May 22, 1846. "An express from the lower Puebla brought a proclamation of the Governor's (Peopico) directing the appointments of delegates by people (consisting of thirty) to meet in St. Barbara on the 15th of June as a convention, to take into consideration the existing embarrassed state of the country and to deliberate upon the measures necessary to meet the exigencies of their political condition. The general impressions are that a declaration of independence will be the result, as it is set forth in the Governor's Proclamation that there remains not hope that Mexico will succor or take any steps for the relief of the country."

May 25, 1846. "Intelligence received from the upper Puebla of a rising of the Rancheroes, headed by an Englishman by the name of Stokes, and Weaver, a citizen of the United States, in opposition to the military control and ambitious designs of General Castro, who is at St. Johns with about forty soldiers, endeavoring to recruit and organize a sufficient force, to displace the existing Governor Peopico, and to place himself at the head of the government, it is believed. Castro has rendered himself unpopular with the Rancheroes and country people by neglecting, (as military commandant of the Province) to take measures for their protection against the frequent depredations of the Indians, who drive away the horses and cattle from their ranches. He is openly accused of squandering and misapplying the revenues of the country, the whole of which arriving from duties on imports, falls into his hands, to the total neglect of the national and popular interest." * * *

June 3, 1846. "Lieut. Gillespie of the U. S. Marine Corps came on board with Mr. Russel from the camp of Captain J. C. Fremont at junction of Feather River with the Sacramento. Lieut. Gillespie showed me a requisition of Captain Fremont addressed to him for stores to be supplied him from some naval vessel, and requested my compliance, also funds he stated were indispensable and could only be obtained at exorbitant rates, which would soon exhaust, he feared, the appropriation for the important service in which his party were employed. In his peculiar circumstances, also desiring to conceal his movements, there might be difficulty or inconvenience in obtaining them; to which I felt my duty, the public interests, as well as the necessities of my fellow citizens, to respond fa-

vorably, and ordered the needed supplies of money and stores to be got ready to forward to the camp." * * *

June 11, 1846. "At half past eight A. M. despatched the launch in charge of Acting Lieut. Hunter, with the following articles of stores for Captain Fremont. Funds also sent by Purser Witmough who with Lieut. Gillespie, Mr. Russel and a pilot, went up in the launch." * * *

June 13-17, 1846. "On Sunday morning, Mr. Everheart, an American resident in Monterey, came on board bringing a note in pencil from Lt. Gillespie, whom he met upon the Sacramento on the previous Thursday (the day of his leaving the ship in the launch) informing me of the capture of two hundred government horses taken by a party of twelve American residents, from an equal number of Mexican troops commanded by a Lieutenant of General Castro's forces; who, after restoring two horses to each man, to speed them on their way, permitted them to proceed with their arms, sending a message to Castro that the foreigners had received intelligence of his sinister designs, of destroying or driving them forcibly from the country, and of his having by secret intrigues engaged the Indians to destroy their wheat when big enough to burn; this last information obtained from Indians themselves, etc. On Monday morning Don Jose De la Rosa arrived on board from General Don Guadaloupa Vallejo, deputed to inform me that eighty Americans had taken forcible possession of Sonoma and made himself, General Vallejo, and several other Mexican officers of note, prisoners, who were on their way under a strong escort to the Sacramento, and apprehending from a party that seemed to act without a head to direct or influence them, that acts of violence might be perpetrated upon their defenseless families and others in and about Sonoma, requested the interposition of any authority of influence I might have over them, for their security. I replied to General Vallejo in effect that my position as an officer of the United States government precluded my interference between the conflicting parties, or with any political or popular movement of the people of California, disclaiming at the same time any previous knowledge of this rising of the people and all agency on the part of my government or by myself in producing it, which seemed to be called for by the implication embraced in General Vallejo's request for the exercise of authority with the insurgents. I expressed my readiness, however, to use my friendly endeavors to prevent the perpetration of violence upon the defenseless people of Sonoma, and at once directed the First Lieut. Misroon to be prepared to proceed in one of the ship's boats to Sonoma in the morning for that purpose. On Tuesday morning, before Lt. Misroon had started on the mission assigned, a courier arrived on board from Sonoma bringing a letter from the insurgent chief at that place, confirming in part the statement of De la Rosa, but rep-

resenting the number of their forces at Sonoma to have been thirty-five instead of eighty persons in the first instance, ten of whom were sent in charge of the prisoners to the Sacramento, leaving twenty-five only in charge of the place. The letter states the nine pieces of cannon, and stand of small arms, with ammunition and ball cartridges, etc., etc., in sufficient quantity for rifle and musket use, to sustain themselves against any attack which could be made upon them with small arms, but apprehended they should fall short, if their artillery should be called into requisition, as was probable in case of an attack from the government troops, and requested a supply from the ship, which, of course, was refused on the ground of neutrality; my position and duty here compelling me to abstain (much in opposition to my sympathies, I confess) from rendering aid or facilities to either of the parties. I told Mr. Todd the insurgent messenger (a very intelligent and clever Kentuckian) that I was about to dispatch a boat with an officer and General Vallejo's messenger to Sonoma, with a request to his chief in behalf of the terrified families of that place, to which he replied that he was happy to hear it, and would be glad to return with them, and send his horse back by another, which was assented to. He stated that a full and satisfactory guarantee for the security of the people from harm had been given by proclamation almost immediately after taking possession, and that it was well understood that condign punishment would promptly meet the transgressor; that if Vallejo had been less precipitate in sending to me, he would have seen no necessity for the trouble. I addressed a hasty communication in reply to the one received from Mr. Ide, and dispatched the boat at about 10 A. M. with Lieut. Misroon and the courier of both parties. I have no doubt of the honest motives and intentions of the insurgent party in this serious movement, which is in all probability, although small, the beginning to eventuate in their ruin or glorious triumph over their insidious enemies, who are charged with the design of cutting off by the hand of oppression, or driving from possession, the American resident of the country. Their present leader, William E. Ide, although vilified and abused by the Mexicans, is represented to me by persons who know him as being one of the most wealthy and respectable men in California, and an exceedingly intelligent and judicious man, whose name and character cannot fail to inspire confidence and give weight to the cause he has espoused. Not the least important feature of their scheme, as presented in Mr. Ide's letter, is that of declaring the independence of California, and in due time annexing with the United States."

June 18, 1846. "The boat with Lieutenant Misroon returned from Sonoma with intelligence of the perfect quietude and security of the place from violence and disorder; that excellent discipline prevailed among the insurgents, who had, by proclamation and a

written pledge given to Mr. Misroon, guaranteed the entire security of the people from harm of every kind. Mr. M. brought with him the proclamation issued by the insurgent chief on the 15th day after the capture of the place, and related an anecdote in illustration of the order and discipline prevailing there, as follows: A young man in leading out a horse belonging to Vallejo, was severely kicked by him in the face, and in passion picked up a musket and shot him dead upon the spot. The discharge of the gun brought together at once some of the party, who, on understanding the case, told the boy that he had violated the faith and solemn obligations of the party, and must be punished, and the boy expressed his willingness to pay the value of the horse, thirteen dollars, and acknowledging his error, the remuneration was accepted, and the offender let off upon a promise of being more careful in future."

June 19, 1846. "Omitted to mention yesterday the receipt of a despatch from Don José Castro, Commandant General of Upper California, calling for explanations respecting the conduct of Captain Fremont, whom he charged with having invaded the province with a party of armed men, of operating against the private and national interests of the country, and of taking possession of the military post of Sonoma, and making prisoners of several important Mexican officers, etc., etc., which duly answered." * *

Yerba Buena. June 28, 1846. "At 6 P. M. a sailboat arrived bringing Lieut. Gillespie, who came immediately on board with information that he had separated from Captain Fremont at St. Raphael, twelve miles to the north of my anchorage, who at the head of 160 men was in pursuit of a Californian force under De la Force, having a day or two previously determined to change his course and assist the revolutionists, in consequence of hearing that Castro was proposing and had expressed the determination to drive him from the country. *This course of Captain Fremont renders my position as a neutral peculiarly delicate and difficult. Having avowed, not only my own but Captain Fremont's entire neutrality and non-interference in the existing difficulties in the country, in which it can scarcely be supposed, under the circumstances, that I shall be regarded as having spoken in good faith and sincerity.*" * *

July 1, 1846. "At 9 A. M. a boat from Point St. Puebla gave information of the retrograde march of the Californians under Castro towards Santa Clara yesterday on being rejoined by the retreating party under De la Torree from before Sonoma. At 10 A. M. received two notes from Lieut. Gillespie at San Solito, dated June 29th and 30th, and postscript of this morning informing me that Captain Fremont with a part of his camp had advanced to San Solito, Captain Fremont having crossed the passage to the Fort to spike a number of brass guns mounted there; one of his men having been accidentally shot by his own rifle, he requested that I would receive

him on board. Dispatched a boat to bring and the gig with Lieut. Misroon to see Captain Fremont." * *

July 2, 1846. "At 3 P. M. the gig with Lieut. Misroon returned bringing intelligence that Captain Fremont had succeeded in spiking seven brass guns in the Fort, and that he intended fitting a launch in his possession with two swivels and twelve trusty men to be employed in keeping open the narrows between the bays, and in intercepting or preventing all communication across on the part of the Californians; while with the main body of his force he would make a circuit round by the Sacramento, with the view of bringing Castro to battle in ten days, who, unsuspecting of any such design, it was believed would remain stationary at Santa Clara or the Puebla above. At 10 A. M. Captain Fremont moved from San Solita, leaving a small guard to make prisoners, and follow him in boats to the Sacramento." * *

July 3, 1846. "Six of the insurgents passed from San Solito to Yerba Buena, and took a Mr. Ridley, Captain of the Port, prisoner, and sent him to the Sacramento. At 4 A. M. despatched the launch with Acting Master Harrison to Monterey, all communication by land being intercepted. Omitted yesterday to mention the reception on board of George W. Brewer, one of Captain Fremont's company who had received, accidentally, a dangerous wound from his own rifle." * *

July 5, 1846. "Informed by the Vice Consul of the United States that all the Spanish and Californian families having been removed from Yerba Buena at the instance of the Prefect Guerra, an attack upon the American and other foreign residents was apprehended during the night, by Guerra and Francisco Sanchez at the head of a number of Californians known to be hovering about in the vicinity. The brushwood and bushes in the rear and to windward of the town have been fired in a number of places by them, with the view of setting fire to the town, and at 6 o'clock P. M. intelligence was brought in that a party of sixteen had joined them at the Mission of ——— in the neighborhood. Eighteen foreign residents have banded together to watch during the night, and to act in defense if necessary, but poorly supplied with arms. At 9 P. M., at the earnest request of the Vice Consul, and receiving a message from Mr. Mellen that all property in the town belonged to Americans and foreigners, Lieut. Misroon with Lieut. Watson, of Marines, and eighteen of the guard and three of the crew with their arms, were sent on shore to protect the Consulate and American citizens with their property from attack or violence. The night passed without disturbance, and the officers with marines returned on board at daylight." * * *

July 7, 1846. "Lieut. Bartlett returned in the fourth cutter from the Sacramento, and last from Sonoma, bringing me a letter from Cap-

tain Fremont, who left Sonoma with 180 men yesterday, moving for Sutter's Fort, on his way to Santa Clara, the headquarters of General Don José Castro." * *

THE FLAG OF THE UNITED STATES HOISTED.

Yerba Buena, July 9, 1846. "Clear and pleasant weather and moderate winds from the south and west. In the evening received a telegraphic dispatch from Commodore Sloat at Monterey by the hands of Mr. Pitts, informing me of the formal occupation of that place by United States forces of the squadron, and directing me to occupy and hoist the flag of the United States in Yerba Buena, which was duly effected at 8 o'clock A. M. with a salute of twenty-one guns from the Portsmouth. Seventy men suitably armed, including Marines, being landed and marched to the flag staff in the public square for that purpose, after which the proclamation of the Commander-in-chief to the people of California was publicly read in both languages. A proclamation was then read calling upon the male residents to meet together and form themselves in a military company, elect their own officers, etc., with a view to general security from attack, which was completed before noon, the company consisting of persons from the United States, England, Germany, Russia and Chili, numbering thirty-two in all, assuming the title of the Volunteer Guards of Yerba Buena; a party of whom, under Lieut. Misroon, of the Portsmouth immediately proceeded to the Presidio and Fort at the entrance of the bay, to inspect and report their condition to me. Lieut. Watson, to whom the command of the Military, including the Marines on shore, was given, established his quarters and barracks in the Custom House on the Square. At 12 o'clock (noon) Mr. Die arrived from Monterey with a duplicate of telegraphic dispatch to me. Lieut. Revere was dispatched in a boat to Sonoma with a letter from Commodore Sloat to the Commandant at that place, taking with him two flags of the United States to be hoisted at Sonoma, and Sutter's Fort on the Sacramento."

July 10, 1846. "Employed during the day in completing various arrangements for the better security and good government of this port. Sent on shore Lieuts. Misroon and Bartlett, the former to examine sites for the location of a small fort, the latter to take inventories of property, etc. Sent thirteen muskets with bayonets and filled cartridge boxes on shore for the use of a newly organized militia company, also the six pounder boat gun with cartridges and grape shot, which was planted in front of the barracks in the Square." * *

[TO BE CONTINUED.]

MEMORANDUM.

Professor Josiah Royce, of Harvard University, in an article upon the acquisition of California (*Century Magazine*, March, 1891), made the following remarks:

"There have lately been put into my hands, by the Editor of the *Century*, certain original documents of decided importance for the history of the seizure of California. I have been asked to examine these and to summarize a portion of their contents, a thing which I the more readily do because they serve to set in a clearer light than heretofore the honorable conduct of an officer whose part in the seizure of California was a difficult and delicate one, and who himself did his duty so well and so modestly that he has in the past, altogether escaped the celebrity that has fallen to the lot of other persons surely not more deserving. This officer, Commander (afterward Rear-Admiral) John B. Montgomery, was in 1846 in command of the United States ship *Portsmouth*. His ship visited California in 1845; returned in October to the southern Mexican coast; was at Mazatlan October 16, 1845, and at Guaymas December 2; and returned again to California, under Sloat's orders, in the spring of 1846. The purpose of her coming was to inquire into the alarming reports that had gone southward concerning the quarrel of March between Frémont and Castro. She reached Monterey towards the end of April, later passing on to San Francisco; and she lay in the harbor of San Francisco until after the raising of the American flag at that port on July 9, a date two days later than the seizure of Monterey. Montgomery's stay at San Francisco thus covered the entire time of the Bear Flag episode. From him Captain Frémont obtained, through Lieutenant Gillespie, supplies to enable him 'to continue his explorations,' and to accomplish his other peaceful duties during that now famous affair. To him, in fact, Captain Frémont also wrote, as he himself declares in his letter to Senator Benton of July 25, 1846 (see Frémont's 'Memoirs,' p. 546), 'describing to him fully my position and intentions, in order that he might not unwittingly commit himself in affording me other than such assistance as his instructions would authorize him naturally to offer an officer charged with an important public duty: or, in fine, to any citizen of the United States.' To Montgomery, also, General Vallejo appealed, by messenger, after the Bear Flag men had made the general their prisoner. From Montgomery, Castro demanded an account of what the Bear Flag meant, and of what part the United States Government had therein; and meanwhile the Bear Flag men themselves were begging him for counsel and encouragement; and every officer on board the *Portsmouth* was longing for the coming of Sloat and for the end of this tedious attitude of neutrality. In this trying position Montgomery kept his head and did his duty with a firmness that the documents before me set in a very clear light."

FRÉMONT TO MONTGOMERY.

NEW HELVETIA, CALIFORNIA,
June 16, 1846.

SIR: I had the gratification to receive, on the 6th, your letter of the 3d inst.; and the farther gratification to receive yesterday, by the hands of Lieutenant Hunter, your favor of the 10th conveying to me assurances of your disposition to do anything, within the scope of your instructions, to facilitate the public service in which I am engaged. In acknowledging the receipt of the stores with which you have supplied us, I beg you to receive the earnest thanks of myself and party for the prompt and active kindness, which we are all in a condition fully to appreciate. * * The people here have made some movements with the view of establishing a settled and stable government, which may give security to their persons and property. This evening I was interrupted in a note to yourself by the arrival of General Vallejo and other officers, who had been taken prisoners and insisted upon surrendering to me. The people and authorities of the country persist in connecting with me every movement of the foreigners, and I am hourly in expectation of the approach of General Castro. My position has consequently become a difficult one. The unexpected hostility which has been exercised towards us, on the part of the military authorities of California, has entirely deranged the plan of our survey and frustrated my intention of examining the Colorado of the Gulf of California, which was one of the principal objects of this expedition. The suffering to which my party would be unavoidably exposed at this advanced period of the year, by deprivation of water during intervals of three and four days, renders any movement in that direction impracticable.

It is therefore my present intention to abandon the farther prosecution of our exploration and proceed immediately across the mountainous country to the eastward in the direction of the head-waters of the Arkansas River, and thence to the frontier of Missouri, where I expect to arrive early in September. In order to recruit my animals and arrange my equipage for a long journey, I shall necessarily be compelled to remain here until about the 1st of July. In the meantime should anything be attempted against me, I cannot, consistently with my own feelings and respect for the national character of the duty in which I am engaged, permit a repetition of the recent insults we have received from General Castro. If, therefore, any hostile movements are made in this direction, I will most assuredly meet or anticipate them; and with such intentions I am regulating my conduct to the people here. *The nature of my instructions and the peaceful nature of our operations do not contemplate any active hostility on my part even in the event of war between the two countries; and therefore, although I am resolved to take such active and precautionary measures as I shall judge necessary for our safety, I am not authorized to ask from you any other than such assistance as, without incurring yourself unusual responsibility, you would feel at liberty to afford me.* Such an emergency could not have been anticipated in any instructions; but, between Indians on the one hand and a hostile people on the other, I trust that our government will not severely censure any efforts to which we may be driven in defense of our lives and character.

In this condition of things I can only then urgently request that you will remain with the *Portsmouth* in the Bay of San Francisco, where your presence will operate strongly to check proceedings against us; and I would feel much more security in my position should you judge it advisable to keep open a communication with me by means of your boats. In this way you would receive the earliest information, and you might possibly spare us the aid of one of your surgeons, in case of accident here. Repeating my thanks for the assistance you have rendered us, and regretting my inability to visit you on board the *Portsmouth*, I am, sir very respectfully,

Your obedient servant.

J. C. FRÉMONT,
Bt. Capt. Topl. Engineers, U. S. Army.

CAPT. JNO. B. MONTGOMERY,
U. S. Ship *Portsmouth*.

THE AMERICAN CAVALRY IN THE WAR OF SECESSION.

(Translated from Revue de Cavalerie, by Capt. J. A. Shipton, U. S. A.)

III.

GENERAL SHERMAN'S adversary, General Polk, had with him only 8,000 infantrymen and four or five thousand cavalrymen under Generals Forrest, Lee and Roddy. Not being able to make a stand against Sherman, he (Gen. Polk) resolved to carry on a guerilla warfare, threatening Sherman's communications and cutting the roads, railroads, bridges, etc., behind him; which explains why the Federal general, without cavalry to oppose these raids, was forced to come to a halt. General Polk had divided his army into two parts; one retired to Selma, the other to the south toward Waynesboro. Grierson and Smith had started from Memphis a few days after Sherman left Vicksburg (February 3, 1864). They marched on Holly Springs and Ripley, and reached the Mobile and Ohio Railroad near Jacinto, causing great destruction along the route. Forrest having learned of the march of the Federal cavalry, set out to meet them, under orders of Polk, with about 4,000 men, and advanced along the railroad, where he encountered the first resistance on the eighteenth of February, in the neighborhood of Okolona; and, on arriving near West Point on the Okatibbec, he was compelled to halt by the serious resistance of a force composed of a large body of cavalry, supported by intrenchments, which barred the way. Forrest here put into practice the following curious tactics, which proves that war is not an absolute science and that the methods to be used depend upon the enemy with which one has to deal. He established intrenchments and rifle pits, armed them with four guns and left there a small reserve, ad-

vancing immediately in front of the enemy with the rest of his troops. In the afternoon of the 20th he attacked the Federals vigorously, and was easily repulsed and driven back. Upon arriving at his intrenchments he dismounted his cavalry, which, operating behind this cover, was able to repulse the Union cavalry. On the following day, Grierson having brought up his artillery which he had left behind, returned to the attack. His advance was checked by the Confederate intrenchments and he was driven back. His troops were routed by an attack of Confederate cavalry and he lost three guns. The Union cavalry, entirely disorganized, was forced to retire to Memphis, where they arrived in small parties, without order and quite exhausted, and in no condition to resume the campaign, having been roughly handled in their retreat by Forrest's scouts, who captured the train within a very short distance of Memphis. On learning of this check to his cavalry Sherman himself determined to retreat, all the more so because he was seriously embarrassed by the large number of negroes who came to take refuge in his camp.

This campaign is very curious, for we must remember that Sherman had four times as many troops as his adversary. The loss of his cavalry forced him not only to give up his advance, but even to retire before the comparatively weak enemy which was opposed to him, for he justly feared, in the presence of that active cavalry, that his supplies might be completely exhausted. We also see the strange spectacle of cavalry fighting behind intrenchments,—in this case a sort of *fortress cavalry*. However, it fought very well since it succeeded, and if we admit, as we shall be forced to admit in our next campaign, that the cavalry carries carbines in order to use them, we shall be very fortunate if we find natural or artificial intrenchments to shelter us, for we cannot and we must not pretend to oppose infantry in open campaign. We recall, moreover, that at the battle of Spicheren two squadrons of dragoons checked an entire German division. Neither can we forget that if the first arm of the cavalryman is his horse, he has two others beside,—the sabre and the carbine; that, according to the circumstances, the horse must serve to enable him to utilize these arms to the best advantage possible; and that *circumstances* alone must determine the preference to be given to one or the other, and not merely a generous sentiment, very brave and very cavalier, it is true, but which might easily bring great mortification to one who was determined to use the sabre at the wrong time. Some people fear to tie down the cavalry in recommending that it be armed with the carbine; this is a mistake, for the cavalry which understands how to use the carbine has no longer any need for an infantry support, having in itself a great power of resistance, which permits it to go farther away and be much more audacious, because it is in itself stronger and more able to resist the enemy's attack. We have no doubt, moreover, that in the next war we shall see great corps of cavalry operating like those of Morgan, Stuart and Forrest, at great distances; not,

perhaps, for the purpose of making raids, but for the purpose of transporting rapidly four or five thousand men to a given point, who, suddenly thrown into action, can promptly change the fortunes of the day and decide a victory.

It was necessary in the war of 1870 to invent armored trains; it was necessary in the Transvaal to create mounted infantry. Both of these were employed in the war of the United States, which is too little known and which has not been sufficiently studied. The same is true of the American cavalry combats; there are many things to learn from them, considering all the circumstances, and the character and customs of the inhabitants.

After the retreat of General Sherman, Forrest, in accord with General Johnston, who commanded the principal forces to the west of Dalton, resolved to complete his success and put an end to the expeditions of Sherman and Thomas by making war on their communications and again invading the State of Tennessee. At the head of 6,000 men, which he divided into several columns, he invaded that State, ravaging all hostile localities and destroying railroads. On the 24th of March, his troops presented themselves simultaneously before Paducah at the mouth of the Tennessee River on the Ohio, and at Union City, an important railroad junction to the south of Paducah. Union City was guarded by 500 cavalrymen of the 7th Regiment under Colonel Hawkins. He easily repulsed three Confederate attacks and then surrendered.

The defenders of Union City, summoned to surrender, evacuated the town and fortified themselves in Fort Anderson, where they resisted all attacks, assisted by the gun boats on the river. Forrest was forced to retire, which he did after having pillaged the town. He had lost a thousand men in the different assaults he had made, without accomplishing any results. He withdrew to Eddyville, raiding on the way all localities which did not make common cause with the Federals. He went back down the Mississippi River and advanced to attack Fort Pillow a little above Memphis with the two brigades of Bell and McCullough. The garrison consisted of nineteen officers, 538 men, and was composed of artillery and a battalion of the 13th Tennessee Cavalry.

FORT PILLOW.

On the 12th of April the Confederates drove in the out-posts and vigorously attacked the place, after having compelled all the troops to withdraw inside the ramparts. The fight lasted two hours, at the end of which Forrest sent a representative to demand the surrender of the fort. Major Bradford, who commanded it, ordered "cease firing" and asked for a truce of an hour in order to prepare his answer. While this council was going on, Forrest caused his men to advance into the ditch right up to the foot of the ramparts, replying that he would grant a truce of twenty minutes only, and as soon as his representative had returned, the entire force threw themselves forward immediately into the fort, meeting with no resistance whatever. Then took place a horrible

massacre. All the artillerymen, who were negroes, were given over to the sword, not even women and children being spared. One or two officers and about a hundred men only were able to escape. Major Bradford was at first taken prisoner, and was afterwards shot between Boonsville and Jackson. This massacre created enormous excitement throughout the country and brought reprobation on Forrest and his troops. It, however, shows very clearly the motive of this war between the two rivals, and it may be said that the War of the Secession had, indeed, but one cause,—slavery,—and that the masters of the slave regarded the negroes serving in the Federal army as rebels over whom they had the right of life and death. This was often one of the causes of the great bravery of the negro regiments, for they knew very well that if they were captured they might expect no quarter.

Forrest tried again to reach Columbus and Paducah. He was checked, and returned to the State of Mississippi, bringing back with him a rich booty of horses and provisions of all kinds. This expedition, executed without plan and without tactical conception, was rather a pillage than an operation of war. It had no influence whatever on the plans of Sherman, who was organizing a new expedition against the Confederate States of Alabama and Georgia with a strong army.

SHERIDAN'S CAVALRY 1864.

The cavalry (of Grant's army) were armed almost entirely with the Spencer carbine which had given such good results, and with the Martini-Henry carbine, a repeater of fifteen shots. Each soldier had also received a revolver with seven shots. The equipment was lightened and the cavalry was organized into corps with light artillery. All these modifications were made by General Stoneman, to whom the Secretary of War had turned over the Bureau of Cavalry, wh ch did not exist at the beginning of hostilities, as a recognition of Stoneman's great ability to increase the importance of that arm.

The cavalry was formed into an army corps with three divisions, under the orders of Sheridan. These cavalrymen wore a red cravat with floating ends as a distinguishing mark.*

Lieutenant-General Philip Sheridan was expected by his new tactics, his tenacity on the battle-field, and his great military qualities, to bring the war to an end and compel the surrender of General Lee. It must be remarked that the raids which he executed were the more hazardous because he operated in an enemy's country and could not prepare them beforehand, and also that it was very difficult to use his scouts. He sent them, however, five or six miles in front of the column, causing them to disguise themselves as Confederates. He paid them according to the importance of the information which they brought in. He was obliged to operate with the greatest secrecy, all the inhabitants being spies who sought to discover his plans.

* This custom was confined to Custer's Brigade.—ED.

Sheridan's cavalry fought on horseback with the sabre in hand. Generally, before the attack, the Confederates dismounted and received the Federals with their carbines and revolvers; when there was sufficient time, they charged with revolver in hand. "The Federals often learned to their sorrow that in these engagements the sabre was very much less efficacious than the revolver."*

When Sheridan's cavalry encountered the infantry, they dismounted, and, thanks to their repeating arms, were able to deliver a terrible fire on the enemy. The divisions were generally formed in three ranks; first, the skirmishers, who began the action; second, the support, formed by the regiments in columns of attack; third, the reserve, generally composed of a division.

Sheridan had his cavalry march in columns of fours along a single road, having noticed that he could never have them quickly assembled for a battle if they followed several parallel routes.

Three regiments formed the advance-guard, one a little distance from the main column and on the same road, the two others marching through the fields on parallel roads to the right and left, from one to two miles distant. Each of these was joined to the main body by men placed at two hundred metres apart and was preceded by scouts, spread out in the shape of a fan, to the distance of two or three kilometres. Furthermore, as soon as a cross road was reached, a squadron was sent along this road at a gallop to establish a flanking guard until the main body had passed by. The scouts, sent out at great distances, as was said above, completed the precautions taken for the safety of the command. The rate of march was about fifteen or sixteen miles a day; that is, twenty-four or twenty-five kilometres; sometimes they made as much as fifty kilometres in forced marches; the gait was always a walk. In spite of this leisurely march, many horses were lost in consequence of the inability and inexperience of the men.

The train carried little besides ammunition. Each man had on his horse four days' rations, two days' oats, his tent, his cloak and his horse brush. No change of clothes was carried.

Troops generally bivouacked. The horses were tied to a line fastened to two iron pickets in the form of a corkscrew. When a halt was made to go into bivouac, the three regiments of the advance-guard established a grand guard in a good defensive position, which was strengthened, if necessary, by abattis and intrenchments. Mounted videttes covered the front, and patrols of fifteen or twenty men, led by enterprising officers, went out to a distance to reconnoitre, leaving behind them "correspondence posts," so as to insure the prompt transmission of intelligence.

Sheridan had with him at first four batteries of five pieces each. Finding that it bothered and delayed his column, he reduced his artil-

* Gen. Faverot de Kerbrech.

lery to a single battery. General Sheridan * was absolutely convinced that in a battle the cavalry, acting as cavalry, this is to say, on horseback, is to-day ineffective against a cavalry well drilled in the use of long range rapid-fire arms. He only approved of cavalry against cavalry when there was no time to dismount. Finally, he no longer believed in the sabre, even in the case of cavalry charges, He thought that cold steel had had its day and that in the charge, and much more in the *mêlée*, the revolver alone is efficacious.

He said that he was the first in the history of modern wars to successfully employ cavalry mounted, combining solidity and facility of being rapidly transported from one point to another.

He affirmed that with ten thousand men, conducted according to his principles, a number which, according to him, is the greatest that a single general can handle, he could prevent the concentration of an army of a hundred thousand men, He would attack at first the cavalry of that army, which he would quickly destroy by the fire of his own cavalry. He would afterwards march around the rear of that army, destroy the railroads, bridges, etc., so as to interfere with the transports and prevent the mobilization of the various elements of the army as they successively march to the rendezvous. The extreme mobility of his troops would permit him to either refuse or to accept combat.

This opinion of Sheridan admits of discussion. It is, however, to be carefully studied, and we do not see to-day the justification of the tendencies, more and more marked, to make the cavalry take part in the infantry fight by all the means in its power, whether by the charge or by the carbine. It must not be forgotten that the American cavalry at the end of five years of warfare had become very experienced and extremely skillful; that the war had formed the leaders and the soldiers, and if on account of the special conditions of this war, everything cannot be copied, that there is, however, much which should be retained.

CAVALRY OPERATIONS IN THE WILDERNESS.

Lee's army in the rear of the Rapidan, numbered 100,000 men, and his cavalry was still commanded by Stuart. It was intrenched in front of Orange, the right towards Chancellorsville and the left on Gordonsville. The cavalry beat up the country on the flanks, and the outposts were strengthened by abattis and field fortifications. Grant ordered the army of Meade to turn this position by the left flank. The movement commenced on the 4th of May. On the night of the 3d of May, the cavalry established bridges over the Rapidan, and on the 4th of May, in the evening, three to four army corps had crossed the river.

On the 5th Stuart's cavalry had engaged that of Sheridan. Lee had meanwhile been promptly warned of the march of the Federals and had made a change of front in order to await the attack. The two armies engaged in a bloody battle on the 5th, where the Federals suffered most

* Gen. Faverot de Kerbrech.

severe losses. On the 6th, both adversaries having called up all their reserves, the battle recommenced still more furiously and with still greater losses on the Federal side. On the 7th the battle was resumed immediately, the numerical superiority of Grant permitting him to continue the struggle, which he did with great obstinacy. Lee had, however, fallen back on his central positions and his troops responded but feebly.

Continuing resolutely and without respite the execution of his plan, which was to turn the enemy's right flank, Grant sent his cavalry to Spottsylvania and supported it by Hancock's corps. He also sent a detachment of cavalry to Fredericksburg to establish a base of communication in case of a check and to organize there the hospital corps and the depots of supplies. The cavalry, which on the 5th and 6th had not been able to take part in the combat in the covered country in which the fighting took place, was limited to covering the extreme left. On the 7th it advanced promptly toward Spottsylvania,—too promptly, even, for its arrival early in the morning in that locality disclosed to Lee the intentions of his adversary. The cavalry pushed back the outposts of the enemy and about three o'clock in the afternoon had a severe engagement with the enemy's cavalry near Todd's Tavern. The Federals were obliged to withdraw.

THE RICHMOND RAID.

The cavalry had not taken part in the last battles, for since the 9th of May the Federal cavalry had been detached to make a raid in the rear of Lee's army, and Stuart had been sent in pursuit of it. On the morning of the 9th, Sheridan's cavalry took the road with five or six days' rations. It marched back to the rear in the direction of Fredericksburg, then, turning to its right toward the south, it marched on the North Anna, which it crossed about nightfall at Anderson. Custer's brigade burned the station at Beaver Dam, two miles below, set free a convoy of Federal prisoners, and captured a certain quantity of wagons and rations. In the evening the column bivouacked on both banks of the river, strongly pressed by the Confederates, who destroyed almost an entire regiment, the 6th Ohio. In spite of the presence of the enemy, on the 10th Sheridan resumed his march to the south and crossed the South Anna at Ground Squirrel, where the bridge was destroyed. In the evening he camped near Goodall, still harassed by the fire of the enemy, who followed him without respite.

On the 11th, at three o'clock in the morning, Davies' brigade marched on the station at Ashland, destroyed much valuable material and removed five or six miles of rails. The column continued its march on Richmond, in spite of the fact that the enemy showed himself more and more pressing, and that he endeavored more seriously to oppose the passage. Upon arriving at Yellow Tavern, there was a lively engagement with Stuart's cavalry, which was repulsed and compelled to double back on Ashland.

General Custer continued his advance by Brock Road in the direction of the Confederate capital, penetrated right up to the rifle pits of the place and made prisoners of a hundred Confederates. Stuart came up again and succeeded this time in repulsing the Federals, but he himself was mortally wounded, which was an incalculable loss to his side.

On the 11th bivouac was made in plain sight of the enemy's works, which they continued to reconnoitre. Everybody was found to be on the *qui vive*. On the 12th the column marched to Meadow Bridge on the Chickahominy, where the bridge was found to be cut. The first division, which marched at the head of the column, re-built the bridge under the enemy's fire, and the column was enabled to cross over without too serious a loss, although the rear guard was attacked and the fire of the Confederates was continued right up to the river. The column marched to Mechanicsville and Cold Harbor and bivouacked at Gaines Mill on the old battle-field of 1862.

On the 13th, Sheridan re-crossed the Chickahominy at Bottom's Bridge, marched to the Pamunkey and re-joined Butler's army at Hanall.

One may question the utility of this brilliant raid and whether the results obtained were in proportion to the losses sustained; 600 men had disappeared and a still greater number of horses, for a few storehouses burned and some rails carried away. If Sheridan had been able to completely cut off the communications of Lee, to destroy his stores, the effort would have been justified; but it seems that it would have been better, considering the unfavorable terrain, if he had remained with Grant and assisted in his operations against Lee. It may be said that he took away in his train the cavalry of Stuart; but it would have been better to have tried to have beaten it immediately in order to get rid of it, and Stuart himself, in place of following, would also have done much better to have remained with Lee and have watched and opposed the movements of the Federal army, for that was the important point. Sheridan could not accomplish anything against Richmond or other strong posts. Certain raids are necessary, especially at the beginning of a campaign, but it is not necessary that the chiefs of cavalry shall allow themselves to be drawn away uselessly on these expeditions so full of seduction for an audacious and enterprising general to whom such things give the glory of a great renown. It is always essential that every sacrifice be in proportion to the result to be attained. Sheridan's cavalry, moreover, was useless to the army of Butler, which was operating between Petersburg and Richmond, and which at the end of a few days went into cantonments within his lines without attempting anything against either of the two places, and did not move again. This cavalry, however, was recalled and had re-joined Grant on the 25th.

He (Grant) caused demonstrations to be made on the enemy's left on the 26th by Sheridan's cavalry and at night he resumed his move-

ment towards the southeast. Early in the morning after a lively engagement, the cavalry captured the ford at Hanovertown on the Pamunkey. On the evening of the 27th and the morning of the 28th, the army crossed the river, while the cavalry was thrown forward to Cold Harbor and Mechanicsville, where it had frequent skirmishes.

Lee, conforming his movements to those of the Federals, had withdrawn behind the line of the Chickahominy and established himself between Atlee Station and Shady Grove, covering the railroad and the roads leading out of Richmond, and carefully strengthening his position with field fortifications. On the 30th there was a severe fight on the road to Mechanicsville. On the 31st Sheridan, with Gregg's and Torbert's divisions, had a warm encounter with Fitz Hugh Lee's division of cavalry, while at the same time, on the other wing, another detachment of cavalry was defeating a Confederate brigade and destroying the railroad bridges over the South Anna. The cavalry fights on the flanks continued up to the first of June, up to the moment when that part of the army was compelled to give place to the infantry which had arrived on the line, and to put itself into reserve. This however, did not prevent Torbert's and Gregg's divisions from taking part on foot in the attack on the Confederate positions by Smith's corps. The two armies continued to fight without decisive success on either side, up to the 5th of June, each of them covered by entrenchments and abattis skillfully organized, and each checking the other as soon as it came to attack the fortifications. Sheridan's cavalry remained on the right wing near Bottom's Bridge.

THE TREVILLIAN RAID.

We shall leave Grant making his almost fruitless attacks against Petersburg and Lee's lines around Richmond, to record a new raid undertaken by Sheridan. Starting from Cold Harbor to re-join General Hunter in the Shenandoah Valley, he arrived on the 11th of June at Trevillian Station, which he captured after causing the Confederates a loss of a thousand men; he then took the direction of Gordonsville, continuing, as in the past, the destruction of the railroad and matériel. Upon arriving at about five miles from the town, he was checked by an intrenched post which he could not force. He resolved to retire, having no news of Hunter. On the 15th he withdrew behind the North Anna, which he descended as far as White House, where he arrived in time to repulse the Confederates who attacked the Federal garrison with superior forces; he continued his route to the south, continually skirmishing with parties of Confederates, and re-joined the Federal army on the 25th. Sum total: much useless fatigue; and he would have done much better at this time to have remained with Grant's army, who had wisely employed what remained to him of his cavalry to destroy railroads, which served the South as lines of communication with the two cities of Petersburg and Richmond.

WILSON'S RAID.

Wilson had lost in this expedition about 1200 men.* No fault must be imputed to him, for his disaster came from the fact that the Federal infantry was checked and could not support him; without that, Grant had acted logically in sending his cavalry to destroy the railroads by which the two important towns (Petersburg and Richmond) and Lee's army received their supplies. The expedition was premature and too audacious; it was also conducted with too much looseness and with too small a number of troops, the army being scattered about from the Pamunkey to the southward of Petersburg. It is General Grant who should be held responsible for this disaster to the cavalry,—the natural consequence of the check to his infantry. The result was, however, that several weeks were required to re-establish the roads which Wilson had destroyed, which was a great advantage when one remembers the enormous number of mouths which expected their rations from that side. Wilson had very carefully organized a cavalry corps and he had 17,000 mounted men. He carried many rations with him, partly on the men and partly by convoy. Like Sheridan, he reduced his artillery, too numerous at the beginning, and had only one piece for each 2,000 men. He, also, kept himself well informed by scouts, chosen from among the loyal people of the country which he passed through. These scouts marched fifteen or twenty miles from the column, for Wilson's corps marched on five or six parallel roads, and reconnoitred to a short distance after the methods employed in Europe. The command traveled generally at a walk and took the trot only in exceptional cases. Twenty to thirty miles per day were covered ordinarily; under pressing circumstances forty, or even sixty, miles were covered in twenty-four hours.

CONFEDERATE RAID INTO PENNSYLVANIA.

The Confederates did not limit themselves entirely to that expedition (Early's threatened attack on Washington). Early's corps returned on the 20th of July to the Valley of the Shenandoah. Beginning on the 24th, a cavalry corps again took up the advance and descending that valley crossed the Potomac at Williamsport on the 28th, marching into Pennsylvania. On the 30th, the City of Chambersburg was ransacked and burned. The Federal cavalry set out in pursuit of the Confederates, came up with them and defeated them at Cumberland, forcing them to take refuge toward the west in the mountains of West Virginia. The main body of the Confederates concentrated themselves at Winchester, while Hunter remained on the Monocacy.

This raid and some others made by Mosby on the lower Potomac where the telegraph wires were frequently cut, resulted in hindering the formation of two or three army corps and keeping in Pennsylvania the troops which were necessary on the James, and consequently in prolonging the day of decisive operations which could have taken place on that river.

* Ream's Station.

The command of Hunter's army was given to Sheridan, who made a brilliant campaign against Early, where after different manœuvres and much display of talent on the part of both of the generals, Early was finally thrown back on Staunton and Lynchburg.

* * *

It is not our purpose to follow the operations of Grant against Richmond and Petersburg. * * * We shall only say that the cavalry, dismounted, took part in the attacks, and called attention to the charge of Gregg's cavalry covering the retreat of a Federal corps when its attack had been repulsed. The cavalry, however, was actively employed on both sides in making raids against the communications of the adversary. Thus, on the 16th of September the cavalry of the Confederate General Hampton turning the left of the Union army, having passed behind the adversary's position, to the rear of the extreme Federal right flank surprised a herd of 3,000 beef cattle at Sycamore Church, and succeeded in carrying away this precious booty, almost entire, into the Confederate lines.

* * *

NASHVILLE.

The cavalry played an important part in this battle. On the second day Wilson's cavalry corps fought entirely on foot, and was placed in prolongation of the Federal right wing extending far enough to turn the left wing of the Confederates and threatening their rear. At the moment of the successful attack on that wing, the corps was so placed as to cut off the enemy's retreat. The enemy once routed, Wilson caused two of his divisions to mount quickly and threw them forward in pursuit of the fugitives. This cavalry was temporarily checked by a cavalry post placed behind a barricade, which position was soon attacked and carried by the 12th Regiment of Tennessee Cavalry. The pursuit lasted until the 29th of November, the battle having been fought on the 15th and 16th.

* * *

General Sheridan, with the object of cutting off the supplies of the army of Richmond, received orders to advance by the Shenandoah and to cross the James with all his cavalry, destroy the canal, the aqueduct and the railroad, thereby cutting off the last means of communication by which the Confederates could receive replies, and, beating up the country to the north and west, to destroy the rations and provisions which might have been gathered up by the Confederate army in that locality. He was afterwards to re-join the army of Grant to the south of Petersburg, that is, the army of Sherman.

General Canby was to attack Mobile with an army of 35,000 men, while the cavalry corps of seven to eight thousand men, detached from the army of Thomas, at Vicksburg, advanced on Mobile to join with Canby.

Another cavalry corps of ten to twelve thousand men, under the

command of Wilson, left Eastport, Mississippi, to march toward the army of Canby.

SHERIDAN'S LYNCHBURG RAID—1865.

Sheridan set out on his march on the 27th of February from Winchester with the two divisions of Custer and Merritt, about 5,000 men, all told. The 1st of March he crossed the Shenandoah over the Mt. Crawford bridge, before Early had a chance to destroy it, and entered Staunton on the second of March. He left the city the same day, following the enemy, who, taking the direction of Waynesboro, awaited him there in force. Without taking the time to reconnoitre the place, Sheridan ordered an attack after a cannonade of half an hour, the most of his troops being on foot. The place was carried after a bloody combat and 1600 prisoners, 11 pieces of artillery, 17 flags and 200 car-loads of provisions, fell into the hands of the Federals. After having sent his booty to the rear under escort of 1500 men, Sheridan marched on the 3d to Charlottesville, destroying the railroad as he went along. Having rested two days in that city to finish his work of destruction, he divided his command into two columns on the 6th, one marching on Scottsville and New Market, and the other on Lynchburg, following the railroad. The first column destroyed several portions of the canal and sent a detachment to take possession of the bridge at Duguidsville (?). The Confederates prevented this enterprise by burning the bridge themselves The other column destroyed the railroad as far as Amherst Court House, about 15 miles from Lynchburg, and crossing the foot-hills which separated them, rejoined the main body at New Market.

Sheridan not being able to cross the James, over which all the bridges had been destroyed, and not finding himself in sufficient force to attack Lynchburg, determined to reach White House by a large detour to the east, and went down the canal, which he rendered impracticable for about eight miles to the east of Goochland. Finally, on the 10th, he concentrated all his men at Columbia, warned Grant by means of spies of his early arrival, and requested him to prepare rations at White House. On the 12th he marched to the south toward Richmond, as if he intended to attack the city, then turned to the northeast toward Ashland Station on the Fredericksburg-Richmond Railroad, which he again commenced to destroy; crossing the South Anna and the North Anna, he descended the Pamunkey, and arrived at White House on the 19th of March. Except the battle of Waynesboro he had had only a few skirmishes and the expedition was unattended by difficulties.

CLOSE OF VIRGINIA OPERATIONS.

In spite of the bad weather and the mud, which rendered all movements exceedingly difficult, Sheridan's cavalry marched from Dinwiddie Court House to Five Forks, followed by the rest of the army. The enemy was found very well established in strong positions. However, Grant thought himself strong enough to attack and sent the 5th Corps to support the cavalry.

The 5th Corps took possession of the Petersburg-Five Forks road, while Sheridan occupied the latter place, after having pushed back the outposts of the Confederate cavalry of Hill. The Confederate General had during the day repulsed the first two attacks of the 5th Corps, and had afterwards attacked Sheridan with superior forces and compelled him to fall back on Dinwiddie Court House. In place of continuing his retreat, Sheridan, with his tenacious energy, dismounted the greater part of his cavalry and deployed it in lines of skirmishers, keeping on horseback only a sufficient number of men to care for the horses and a good regiment in reserve. By the aid of his repeating carbines, he succeeded in checking the Confederates, the thick woods preventing them from making use of their masses. At the same time he warned General Grant of the situation and that he would only yield a step at a time. McKenzie's cavalry and a division of the 5th Corps were immediately sent to support him. On the morning of the 1st of April, supported by all of Warren's corps (the 5th Corps), Sheridan resumed the offensive, and succeeded, after a fierce struggle, in throwing the Confederates back on their entrenchments at Five Forks, capturing their works with 18 guns, and five or six thousand prisoners.

* * *

General Lee concentrated all his force near the Mattoax Bridge, where the Danville Railroad crosses the Appomatox, but from the morning of the 3d, Sheridan at the head of all his cavalry and all the infantry that he could put on horseback, followed closely on his heels. A part of Sheridan's command followed the Confederate army, while the other part marched directly to the south along the Danville Railroad toward Amelia Court House and Burkesville. At the same time, General Ord advanced on the latter place via the south side. The cavalry was immediately followed by the infantry.

On the 4th of April Sheridan arrived at Jettersville between Amelia Court House and Burkesville, learning there that Lee had arrived at the former place. Not being strong enough to attack Lee, he fortified himself strongly and advised General Meade to follow in haste. Meanwhile, Ord occupied Burkesville. On the 5th the infantry arrived at these two points.

JOHNSTON AND SHERMAN.

Johnston, threatened from the south by Sherman, from the north by Sheridan's cavalry which was advancing, from the west by that of Stoneman, had no other resource than to capitulate. General Stoneman starting on the 20th of March, had advanced by the Boon Road in North Carolina, had destroyed the Virginia & East Tennessee Railroad at Whitefield (?), Chambersburg and Big Creek (?). From this point he had sent a detachment which had destroyed important bridges and works along the railroad, while he himself had marched to the south towards Greensbore, rendering impracticable, as far as possible, the means of communication, in particular the North Carolina Railroad be-

tween Greensboro and Danville. He also burned the depots and military storehouses, and made several prisoners in the skirmishes which he had with the enemy. He then marched on Salisbury, where he met the Confederate General Gardner, and attacked and completely defeated him, making 1400 prisoners and carrying off 14 guns. The Confederates then destroyed the railroad in the direction of Charlotte, afterwards marching to Slatersville, where they learned of the surrender of Johnston and the flight of Jefferson Davis.

CONCLUSIONS.

This American war is remarkable for the tenacity of the two adversaries. The war, it must be said, came to an end for want of combatants, the Confederates having been pushed to the very last limit of their resources.

The American cavalry played a prodigious rôle, and it must be recognized that its efforts did much to shorten the duration of the war. If we compare the cavalry to that of Europe, we see that it was conducted from the very beginning on an entirely different plan from that of our Continent. We may very well ask ourselves if the life on the manœuvring ground, to which we give such a great importance in Europe, has not killed or greatly reduced the initiative and activity of the arm. With their adventurous spirit, their audacity, fearing nothing, their life on the prairies, the American cavalrymen as soon as they were assembled, entered with spirit into important undertakings, blindly, and, we may say, often without knowing the reasons therefor. From this came real successes, sad repulses and useless losses. As they had neither the too characteristic tradition nor the spirit of the arm, they fought on foot as well as on horseback; they knew the need of becoming infantrymen alongside of infantrymen, as they knew how to take to their heels when separated from all support.

Let us glance at the campaigns in Europe of the second half of the last century, and compare the work of the American cavalry in a single war with that of the cavalry of our Continent in this period. In 1859 the cavalry did almost nothing; we may mention the charge at Solferino: in 1866, we may mention the charges at the battle of Sadowa, and after that battle the skillful pursuit by a division of cavalry: the German cavalry could not even keep connection between their two armies, that of the Austrians remaining inactive. In 1870 the German cavalry spent its time in losing the contact, although it was in no way interfered with by that of the adversary. In 1877 and 1878 we see nothing worthy of notice, outside of the raids of Gourko, and, moreover, the Russian cavalry was one which rendered the greatest service on the battle-field.

Can it be said that we approve of raids in American style? Yes, and No. Yes; because we believe that at the present time in Europe, with such numerous and such excellent routes of communication as every country boasts, a corps of ten thousand cavalrymen with guns

could march to great distances with a great deal of independence and without having to fear disaster if it is well conducted; but these expeditions are very expensive, and they should only be made when the benefit to be derived is in proportion to the sacrifice to be made.

Let us keep our tactical science; let us keep our skill in riding, and our manœuvring grounds; and let us acquire the spirit of adventure, and the initiative and tenacity of the Americans. We may state, in general terms that in raids, the normal pace was almost constantly the walk; that the main body always marched as much concentrated as possible; that the scouting was done with great care; and that minute precautions were taken for security on the march; that the Americans very greatly abused their horses, especially in the beginning; and that the cavalry of the North, which generally marched more slowly, used up fewer horses than its adversary.

For the conduct of the march, for the services of security, for the battle-field, etc., there were no absolute rules, the greatest discretion having been left to all officers.

All the generals reduced the number of their pieces of artillery, preferring lightness to quantity, desiring that the guns should be able to follow them everywhere, and that they should not become impedimenta and thus encumber the main body.

The Americans have also arrived at the conclusion that the cavalry should be employed hereafter on the field of battle as mounted infantry.

Many prefer the revolver to the sabre in the charge and for individual combat. They think, however, that the sabre should be preserved as a last resort. A very remarkable thing it is to see the rôle of the cavalry, which was despised at the beginning, increase, with experience gained in war, to such a point that cavalry corps of from ten to twenty thousand men were formed. The cavalry was given considerable strategic rôles, and was often sent to great distances, which did not prevent it from fulfilling its tactical rôle with the greatest intelligence, whether in assuring the security of the troops, or in reconnoitring or concealing their movements. The American cavalry ought, then, to be studied with care; for, taking into account the peculiarities of race, and the special aspects of the war, it accomplished great things, worthy of being meditated upon, and imitated on occasion by European cavalry.

CROMWELL'S ARTILLERY.—In "the artillery," says Mr. Frith in his book "Cromwell's Army," we see guns loaded from barrels of powder placed behind the gun during action. "From the barrel, by means of a large iron ladle, the gun was charged, and between each discharge it was the business of one of the gun's crew to cover the top of the powder-barrel, in order to prevent an explosion. Such accidents were not infrequent, and at the siege of Reading, in 1643, a gun was disabled, four men killed, and about a dozen others badly hurt by the blowing up of one of these barrels." * * *

SOME LESSONS OF THE SOUTH AFRICAN WAR.*

(Translated from Revue de Deux Mondes by Lieut. Gordon Robinson, Artillery Corps, U.S.A.)

DOES the South African war teach anything of value to Continental armies?

Certain professors of the military art deny it, and especially those who, seeing in the history of the Napoleonic campaigns the strategical and even the tactical gospel of the science, insist upon applying to modern arms the methods of former times. This is why, in the most of European grand manœuvres, one still sees, after a preparation by a more or less prolonged fire, attacks called "decisive" executed by infantry in compact masses, directed upon the adversary to the sounding of the charge by the musicians. Decisive? Certainly; since the 18th of August, 1870, attacks of this kind have been so, but only for troops who have tried them. Without exception they are terminated by bloody disasters.

But the preachers of the imperial creed do not admit changes. They extol the war of masses of the beginning of the century, and supported by the particular natures of special arms, which tend to acquire increase of their power in heavy groupings, they disregard a principle laid down by the master: "An army ought to change its tactics every ten years."

This sentiment of resistance to progress exists especially in the oldest armies. Ancient methods are sacred legacies, which each considers itself bound to transmit intact. At Jena, Prussia succumbed to the consequences of it. At the beginning of the Revolution, the military art found itself reduced everywhere to a servile copy of the methods of Frederick the Great. However, the rifle in the hands of skirmishers constituted a factor which made itself felt. Frederick had not utilized it, for in his time fire counted for but little. The bayonet was the decisive arm. The Prussian army, like the French, saw in his manœuvres the secret of victory and disapproved of any change.

A board of the most able officers, such as Bourcet and the Baron du Theil, Bonaparte's teacher at Auxonne, prepared the tactics of the Revolution, which replaced those of Guibert and Gribeauval. But what a laborious evolution it was! The patient investigations of the 18th century made for the purpose of determining the tactical consequences of the employment of fire, would probably have remained neglected still longer had it not been for Napoleon. His genius grasped the importance of this fact. In the face of the Prussian school, wedded to its doctrine, he employed fire to blind and cripple his adversary during the time necessary to prepare for the decisive movement—the shock.

The thundering battles of the Emperor led the armies of the 19th

*It is understood that the author of this article is the distinguished Major General de Négrier of the French Army. [Ed.]

century to model themselves after his methods; in the same way that those of Frederick were imitated to the end of the 18th century.

But blind infatuation with the past led to faults which precipitated the Prussian army into the disasters of 1806. Like everything that surrounds us, the art of war is in a state of perpetual evolution. It is not a fixed science, capable of being completely studied in the past. Genius, such as that of Hannibal or Napoleon gives its imprint to the military science of its day, and develops it to the highest degree of perfection to which it is then able to attain. It shows some admirable examples and dispositions which are suited to its own times—nothing more. It is useless, then, to wish to imitate these old masters, our instruments of war to-day being so different from theirs. The art of war is simple and entirely a matter of application; has it not been said that application should conform to the means at hand and should vary with these means?

Military history shows that evolutions of this kind progress with difficulty during periods of peace; at least, no new facts are brought to light by experimental indications. It is then a piece of good fortune for such armies as are enabled to be spectators of a great conflict.

In this respect the South African war contains a number of lessons. Evidently the unusual conditions under which it was fought make it impossible to arrive at definite conclusions. In every case it shows clearly the insufficiency of the methods employed in battle to-day.

The purpose of this work will not be, then, to determine the tactics of the future, for taken as a whole, they will depend still more on the moral attitude of the nation at the beginning of the war and upon the individual ability of the soldier, than upon strength of armament. This moral feature is so important a factor that failure to consider it will be dangerous in its effects.

In analysing the new conditions of the battle, it becomes possible to take account of the necessities thereof and to give an experimental basis to the instruction of troops.

Magazine fire and smokeless powder had driven the English to a total abandonment of their former methods. A new tactics completely different from that at present employed in the majority of European armies, has been improvised and has compelled its adoption, but at the price of what sacrifices?

The army which will know how to profit by two years of bloody lessons, will avoid them in the future.

Let us cease insisting on it and no longer seek to imitate but to reflect upon the tactical evolution of the English army.

But, before all, justice must be rendered to the sometimes malevolent critics upon the continent who have addressed themselves to the English commanders and troops.

Without stopping to examine the strategical dispositions, it is well to remark that it is always easy to find defects in any operation. It is too

often forgotten that politics exercises an unfortunate and sometimes preponderating influence upon the movements of armies. But in the domain of tactics judgment is passed upon such facts as each is able to verify. Thenceforth, it may be affirmed that, the history of this war will be written to the great honor of the corps of officers of the English regular army.

In every case it has spent its blood with a generosity to which we must render homage.

As for the troops, those who took part in the campaign of 1899 and 1900 were excellent. They have displayed a perfect *morale*. It is usually admitted and confidently repeated that English troops are not capable of great efforts unless they are well taken care of. The remarkable operations of Lord Roberts have proved that this opinion is not well founded. Commencing on Feb. 8, 1900, English soldiers have raised—thanks to the resistance of men suffering from hunger and fatigue—the sieges of Kimberley (Feb. 15th) and of Ladysmith (March 1), accomplished the surrender of Gen. Kronje (Feb. 27), and the capitals Bloemfontein (March 13), Johannesburg (May 31) and Pretoria (June 6), as well as obtaining control of the railway systems of the two republics. These operations extended over a course of more than 600 kilometres, in a country barren of resources. The privations suffered by the English were very great. They had scarcely entered the Orange Free State before being put on half-rations. On Feb. 16, 1900, the Boers had captured a convoy of 200 wagons, carrying four days' rations. This was a serious event for the English, since, at that time the regimental wagons contained no more than two days' rations. The least setback would permit Gen. Kronje to escape. The army was now advancing in a desert country and no longer had a railroad to supply its wants. In spite of this critical situation, Lord Roberts continued his advance. He contented himself with prescribing that the rations should be reduced by half. The 6th and 9th divisions which fought at Paardeberg, Feb. 18, consumed on that night their last half-ration. Does not the results prove that the Commander-in-chief had reason for placing full confidence in the ability of his troops?

These privations often lasted for long periods. During the march upon Bloemfontein, the allowance of rations, regulated according to the necessities of the movement, was never equal to the regular allowance. Sometimes it was even less than half. However, not a complaint was heard. The *morale* of the troops furnished sufficient reserve energy to carry them through such critical situations.

The officers from the beginning having lived with the troops and shared with them the resources of their mess, found that this example well repaid them in the resulting devotion of their men.

To sum up, the troops, from the beginning of the campaign, answered readily all demands of their officers. They showed themselves to be patient, energetic and brave, and if they were unfortunate in many of

their engagements, the cause is found not in a lack of valor, but in the employment of superannuated methods.

This fact was recognized too late. It had already caused the death of their best men, and these it was impossible to replace.

In order to give an account of the tactical evolution subsequently acquired, it is necessary to explain first the battle tactics of the Boers.

I.

The nature, the character and manner of living of the Boers have been well discussed. Their rural life on the vast plains where they were accustomed from childhood to travel on horseback, rifle in hand, and to hunt, and especially their numerous wars against the Kaffirs, had given them an especial training. The manner in which they utilized their abilities is less known. The remarks which follow are from the reports of the officers of different nations who had lived and fought with the commandoes.

In these commandoes, of which the territorial district is the base, no discipline exists other than what results from the will of each man. Their effective strength varies incessantly. Any man wishing to go home simply left his commando, often without reporting to his commanding officer, whom he himself had voted to elect, and returned without formality when he felt so disposed.

But first, we must recollect that the Boers had once before fought against the English. The Transvaal, annexed by England April 12, 1877, revolted December 16, 1880. The independence of the Republic was proclaimed and the insurrection became general. The English forces, small in number, met a series of reverses such as that of December 20, at Bronkhorspruit, near Middelburg, where two companies of the 94th regiment of infantry were forced to surrender, leaving on the field 56 killed and 83 wounded. Five hundred Boers took part in the battle; their losses were one killed and five wounded.

England sent re-enforcements to rescue the besieged garrisons. General Sir Pomeroy Colley did not wait for the arrival of all his troops, and on January 26, 1881, he set out for Newcastle, on Laing's Nek, where the Boers had posted themselves. On the 28th he attacked with two battalions of infantry, a detachment of sailors, 170 horsemen and 6 guns, in accordance with the customary tactical methods. Preparatory action by the artillery, cavalry engagement on the wings, frontal attack by the infantry, bayonet charge: all the regulation phases. The result was deplorable. In a few seconds, the cavalry after having had 17 men killed or wounded and 32 horses lost, was obliged to withdraw. The 58th regiment which had conducted itself with the greatest bravery, and reached a distance of 30 metres from the Boers, was compelled to fall back, having lost 7 officers and 76 men killed and 2 officers and 111 men wounded.

On Feb. 8, 1881, at Schain-Hoogte, another check was experienced. General Colley lost 5 officers and 66 men killed and 136 wounded. Fi-

nally on February 27 occurred the celebrated Majuba Hill affair, the smart of which is still felt by England. In fact, in ending this first war, she lost the Transvaal.

This battle was very important in itself for it showed that the Boers possessed some special methods of attack. The English not profiting by the experience then gained, owed, to this failure to learn, their repeated checks in 1899-1900. Some details showing this will be set forth.

The col of Laings-Nek, where the railroad from Newcastle to Volksruit passes, was held by the Boers who had neglected to occupy the crest of Majuba Hill, situated at 3 or 4 kilometres toward the west and dominating the country. Gen. Colley, profiting by this failure, occupied the small plateau on the summit during the night of Feb. 26 and 27 with three companies of the 58th, one of the 60th, three of the 92d and 64 sailors, keeping as a support one company of the 92d and 140 men. After much painful work, the troops reached the plateau, but instead of holding the slopes, they took position upon a spur which commanded the Boer camp, feeling sure that the Boers would abandon their position when they saw the heights above them occupied.

Exactly the contrary happened. The Boers, seeing the English on the summit, resolved at once to attack them. 150 volunteers commenced to scale the steepest slopes, defiling through the shrubbery and rocks. A second detachment of older men, all excellent riflemen, followed at a certain distance, firing upon every man who showed himself above the edge of the plateau. A third detachment went around and made an attack from the rear. During this time the two first were advancing by echelons. One supporting with its fire the advance made by the other.

As soon as the English were exposed upon the crest, they were attacked, then, their line yielding, the reserves were advanced, and they were compelled to fall back in spite of the efforts of their officers. Suddenly they were taken in the flank by a fire coming from a rocky peak which they had not occupied, but which a detachment of Boers had climbed. An instant after the same thing happened on the other flank. At this time the Boers were firing into the backs of the prone Englishmen. Gen. Colley and 50 men were killed. The rest were either wounded or captured. The Boers, thanks to their tactics, lost only one killed and six wounded.

These remarkable results naturally elicited comment, but only from the point of view of the faults of the English commander. No one was yet ready to believe in an evolution in battle methods, and the troops engaged during 1899–1900, continued to use their old familiar tactics. It cost them dear.

MORALE OF THE BOER.

Another important side to this campaign of 1881 was that the *morale* of the Boers was considerably greater than that of the English. Their accurate fire, which great coolness always renders efficacious, made of

them redoubtable adversaries to troops exposed thereto in close regulation formations, and who failed to utilize the terrain sufficiently to protect their movements.

It is in this condition of mind that the declaration of war of Oct 6, 1899, found the two sides.

It is their ability in the chase that served the Boers best. From the European point of view their military instruction was almost nothing, except a part of the artillery and a few troops of police who had been organized and maintained for some time. But, not being encumbered with heavy baggage, knowing how to support themselves in the field and to shoot straight, they solved all questions with good sense and usually with intelligence. Thus in the matter of field fortifications, they employed original traces and profiles, providing excellent protection against the spreading fire of shrapnel as well as against torpedo shells. During the long months they made much use of them. Their warfare, offensive from the strategical point of view, was tactically defensive. In sieges, they contented themselves with surrounding with works the cities which they were attacking and by constructing trenches to oppose attempts at assisting the besieged. It was only after a year that the veteran commandoes gave up their system of passive defense in order to take up partisan warfare, full of movement, of surprises and of attacks which they maintained even until the recent past and to which they owe so many of their successes.

In the attack, as well as in the defense, the Boers have not employed any other method than that of the Majuba Hill affair, that is to say, the deployment of a certain number of groups of rifles, without support or reserves, occupying advanced positions at large intervals. When, in exception, re-enforcements were sent out, they prolonged on the right and left the line of fire already deployed. For protection against flank attacks, they would take men from a part of the front, and hurry them to the threatened wing. Such movements are possible only with the aid of horses which they kept in small groups near the riflemen.

During long halts, the horses are hobbled, "à la rime," a method which permits them to move slowly and to graze. The horse's head is fastened to one of his hind legs by a strap tied above his knee. If for any reason, such as an alarm the horses must be quickly collected, a horseman, mounted on the first animal he finds, gathers them in by galloping in decreasing circles around them, and then drives them before him to the place where they are wanted.

During battle the Boers leave the reins thrown over their horses' necks and dragging on the earth, like our Arabian cavalry; the horses do not move, and their riders find them again where they had been left.

BOER ENTRENCHMENTS AND ARTILLERY.

From the commencement of operations till June 2, 1900, on which date, at a council held at Machadodorp, the government of the two republics decided by the vote of M. Reitz, Secretary of State, that the war

ought to take on the character of a partisan conflict, the Boers nearly always limited themselves to a simple defense of their positions. Some few attacks, although fortunate, had not yet determined them to assume the offensive. On the defense they made especial use of trenches, dug either on the flank of a hill or at the foot of a slope, and occupied by their best shots. The crests, usually strewn with rocks and giving good shelter, were held by men armed with rifles firing black powder, thus producing a smoke which attracted the attention and fire of their adversaries. When the English marched on that very visible target, and had approached near enough to the trenches at the base, they would open sharply into action and in a short time inflict heavy losses. At a short distance these trenches could not be seen. When night fell, the rifle flashes being visible, they appeared, says a witness, to come out of the ground. These trenches often formed two and even three lines, so placed as to command one another. In such a case narrow communicating trenches would be constructed from one to another. Their development was much greater than necessary for the force by which they were to be occupied, and different traces corresponded to the various hypotheses of attack. They were not occupied simultaneously, but partially, and according to the necessity of the moment. These extensive works, rapidly executed, must have been accomplished by native labor. The Boer does not like to dig in the earth. In their camps (laagers) are found numbers of servants and black drivers. They treat the Kaffirs as the Jews formerly treated the Amalekites. They conquered them and they attached them to their farms. The whip, and at need, the revolver, insure their obedience.

Similar to the arrangements for rifle fire, a large number of artillery emplacements were prepared. The Boers had but little artillery, and ordinarily employed it as a unit. It consisted of four Creusot siege guns of 155 mm. calibre, called Long Toms on account of their great length, and for which the Boers had an almost superstitious devotion, a small number (18) of field pieces of 75 mm. calibre, of Krupp, Creusot, and other types, and finally the 37 mm. automatic guns, commonly called "pom-poms," which had been sold to them by Vickers and Maxim, of London.

This gun, employed for the first time in this war, fires a small percussion shell of 400 grammes weight (the minimum weight fixed by the St. Petersburg convention for explosive projectiles). The cartridges are borne in a woven belt, which engages in the breech. The discharge of each round operates a mechanism which ejects the empty shell, reloads the piece and fires the next round at the will of the operator. This weapon can fire more than 100 rounds in a minute. The points of fall are easily observed up to 3,000 metres. The ranging is rapid. The gunner after firing a shot intended to fall short, directs his fire with the certainty of a stream from a hose. The shells appear to run after one another on the ground.

The moral effect of these guns was considerable. So much so that the English were finally obliged to procure them. They received their first lot on Feb. 26, the day before the surrender of Kronje at Paardeburg, and since then these guns have been made a part of the artillery.

To this artillery of the Transvaal must be added that of the Orange Free State, comprising 14 Krupp pieces and some machine guns.

In their largest battles the Boers have not been able to employ more than 8 or 10 guns of the different models. These were generally well masked and protected, so that in spite of the overwhelming numerical superiority of the enemy they were seldom silenced. The distribution of this artillery was systematic. Each commando had its own gun. Arrangements were made for removing the piece and opening fire from another shelter when it was seen that the enemy had found its range.

With few exceptions the Boers did not employ continuous trenches, but preferably constructed them in elements, 10 to 20 metres in length, sinuous and separated by intervals of 5 or 6 metres. Seen from above they gave the impression of disjointed segments of a long reptile. These trenches were not uniform either in length or construction, but they always had the general appearance of considerable depth, narrowness at the top and width at the bottom. Their cross-section had the appearance of a silo or of an underground cistern. The two walls formed, by their obliquity, a shelter for the head against fragments of shell. Their sinuosity as well as the advancement and refusal of the flanks of the elements and their relative positions, prevented enfilading fire. The angles of certain trenches were arranged to flank obliquely the general line.

The trenches of Gen. Kronje at Paardeburg possessed embrasures built in the parapet and formed of sacks of earth or of plates of corrugated sheet iron, which is found in quantities in South Africa.

Besides his arms and ammunition, each man had in the trenches such articles as were necessary for his subsistence: provisions, bedding, cooking implements, and surgical dressings. These trenches were safe, but difficult to get out of.

Often, at a distance of 150 or 200 metres from the trenches, were entanglements of barbed wire. This could be obtained, everywhere, from the enclosures used for cattle.

In order to prevent their being surrounded, the Boers give to their line of battle, a length extraordinary in proportion to the effective strength.

On the defensive they have shown that these fronts have a great tenacity, even when weakly occupied parts of the line were attacked by considerable forces of English. Their fields of fire being usually unobstructed, they made great use of rapid fire at short distances. So great importance did they attach to this proceeding, that it was not a rare thing to see them establish themselves on a slope on the side opposed to the enemy in order to obtain a glacis of 400 or 500 metres.

This system succeeded so well that the English never succeeded in outflanking their wings. But when one of the flanks of the deployed line was taken in reverse, the rapidity of dissolution and disappearance of the line was incredible. Without orders, without warning, the commandoes took to their horses and escaped. These confused groups of horsemen would stop only upon coming in contact with the convoys left in the rear. However, if the English pressed them too hard, a rear-guard of riflemen would be formed to keep their adversaries at a distance.

The partisan warfare vigorously inaugurated by De Wet, on June 29, 1900, led to a change in the tactics of the Boers. They had acquired more confidence in themselves and more readily assumed the offensive. During the night the commandoes would rapidly change their places. The horses marched at a sort of ambling gait, which permitted them to cover 8 kilometres an hour, for several successive hours. Each man carried on his horse his blankets, a filled water bag, a small supply of biltong, and in a bandolier, his cartridges. Before day-break they would stop in a favorable place, post dismounted vedettes sheltered from view, who remained on the same post the whole day, while the horses browsed and the men rested only to start out again at night-fall. The country would appear deserted and the reconnaissances of the enemy were consequently enabled to pass very near to considerable bodies without suspecting their presence.

BOER TACTICS.

When an action was determined upon, the commandoes would separate into groups, whose strength varied according to the duty assigned to them. It was in this way that on July 16, 900 Boers separated themselves into seven groups, to attack on a front of nearly 20 kilometres a series of posts held by 4,000 Australian, Canadian and other colonial troops. Finding a sheltered place, the groups would dismount and leave their horses behind. The riflemen would then move stealthily, even on hands and knees, to occupy the positions of approach. Their horses following behind them at some distance, maintaining this distance according to the advance made. In general they profited by the darkness of night to get near enough for the most effective rifle range, that is from 300 to 400 metres from the adversary. By day they advanced only upon such points as provided an advantageous approach. In places not provided with cover not a man would show himself, so that the various attacks were often made with considerable intervals among the attacking bodies. Each group subdivided itself in its turn, in order to avoid open places and to take advantage of cover. Furthermore, they never hesitated to make wide detours in order to avoid dangerous zones, and they preferred piling themselves behind shelters to advancing along an open space. As it was impossible to completely avoid the fire-swept zones, these were crossed by small bodies of 3 to 6 men, or even man by man, they taking short runs of 10 to 20 paces. The English fire would always commence too late to check these rushes.

So anxious were the Boers to advance without being seen, that they did not fire during the early advance. Beginning at about 600 metres, and at a signal, they interrupted the advance by a continuous fire from all the small groups, who alternately would fire and advance, using cover for some distance. The less there was of shelter and the nearer the enemy, the more the groups of riflemen were reduced and the less freely was the advance conducted. The chiefs exerted no control. Each group would advance as far as the ground permitted, or remain lying down when shelter was lacking. In this manner the attacking bodies approached the enemy very unequally. In its last phase the Boer attack assumed on open ground, the character of steady fire standing, while on covered ground, the Boers would attain by crawling, a distance of 50 metres from the enemy. By these methods and in these circumstances where the terrain favored their advance, and when they were able to attack on several sides at once, the Boers were overwhelmingly successful. Crawling nearer and nearer, and keeping up a continual fire of progressing intensity, they obtained, in spite of the enormous disproportion of troops opposing them, a greater and greater superiority. On their line of defense the English were unable to show their heads, and the troops in rear were overcome by this fire, without their being able to advance.

The enormous fronts over which the Boers make their attacks have essentially for their end the utilization of the terrain for the advances under cover, and the action of concentric fire upon the points of the adversary's line of battle, where a salient or a sinuosity may present itself. They then profit by this to assail one of these points from several sides at once and to overwhelm it. It is by means of these envelopments at a great distance, then by these continued approaches and the crawling advances that the Boers succeeded in defeating and compelling the capitulation of troops well provided with artillery and of a strength much superior to theirs.

USE OF CAVALRY.

In the use of cavalry the Boers were like the French dragoons of Louis XIV. In the pursuit they show themselves to be masters. They would advance at a gallop along the flanks of their adversary, dismount in favorable places, and crush them by their fire, but they never charged.

Often the English have been so demoralized that they were overcome by one good charge. They suffered great losses and the Boers none. The attempts of the English, either to charge in their pursuits or to enter into an engagement, always failed. Not only had the Boers never even taken the trouble to form themselves into groups to receive charges on the open field, but they attacked the English cavalry by advancing toward it on horseback up to about 600 or 500 metres, dismounting and opening fire. The English cavalry was always powerless against this sort of attack.

In order to search out suspected places the Boers would form groups of 25 to 30 men who approached individually and hid themselves on arriving at effective rifle range. Then, dismounted, they would approach unperceived from several sides at once to reconnoitre.

The mobility of the Boers has often been invoked by the English to explain certain defects. It has been exaggerated. From the beginning of operations up to the moment where partisan warfare became a system the Boers had convoys even heavier than those of the English. Their wagons, drawn by oxen, sometimes contained part of their families. They took, it is true, the precaution of encamping well to the rear of the lines they wished to defend, but in their frequent retreats and the defeats of 1900 it is astonishing that the English had not captured them all. The Cavalry and Mounted Infantry were, however, never lacking in these pursuits, but the fire of a few Boers, who would remain with the wagons, sufficed to keep at a distance any cavalry, however brave it might be. Artillery fire with shells was always employed in the pursuit, but it produced scarcely any effect.

CHARACTERISTIC DISORDER.

But what disorder there was! It existed not only in the camp of the combatants, but even among the governmental personnel. June 2d, 1900, a part of the government of the two republics was transferred to Machadodorp. It comprised President Kruger, Secretary of State Reitz, Under Secretary of State, in charge of foreign affairs, Grobler, the under secretary of state in charge of finances and the under secretary of state in charge of the department of justice. In view of the difficulty, which these personages found in obtaining suitable lodgings at Machadodorp, they remained in their cars. President Kruger had his private car, comfortable enough, surrounded by a car serving as a kitchen, another equipped as a telegraph office and a truck carrying a special carriage intended for traveling, with horses. His physician, who was also his secretary and confidential adviser as well as chief of police, lived with him. The Secretary of State and Mr. Grobler occupied first class carriages which they shared with their assistants. Other cars had been transformed into vans placed upon trucks. Beside these cars were other closed cars containing £8,000,000 in gold, of which the greater part was in ingots, supplies for artillery and infantry and a printing press. Finally were the cars of the guard, which watched over the safety of the Government and its property. All these were standing together in confusion on the railroad tracks near the station, and scattered among them were boxes of provisions, gold, dynamite and other supplies. In this government upon wheels, states a witness, existed manners and customs, indicating the democratic character of the people. For example, the Secretary of State could be seen waiting in line, at the door of the dining room of the hotel, standing between a telegrapher and a farmer.

It is conceivable how some foreign officers, being present at this disorder, and judging events from this point of view, were convinced of the

slight degree of resistance of the two republics. The essential part, the soul of the Boer, an extraordinary combination of grand sentiment, of bravery and lack of pretension, of generosity and indifference, escaped them. Although from the end of 1900 the majority of reports have announced the early end of this war, it was prolonged beyond all expectation, thus verifying the words of Kruger, "The resistance of the Boers will astonish the world."*

(TO BE CONTINUED.)

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* "Amongst the new facts, which General de Négrier comments upon, are the impossibility of telling where the shots come from, of discovering the strength of the enemy or of guessing his position with reference to the hills: whether on the crest, on the slopes or the bottom. The Boers proved that the defense often does well to delay the opening of its fire as long as possible and thus to conceal its position. They preferred often to let their enemy come to close range, so hat they could attack them with a well regulated fire.

The splitting up of large masses of artillery has become the rule Every organization of infantry must as a principle be accompanied by cavalry to explore and by guns to protect its march. The old maxim that 'fire draws fire' is now modified into 'visibility draws fire.'

This attraction which certain points of the enemy's line has for the opponent's fire and the intense attraction which every bit of cover exercises on soldiers, are things which we must hereafter take account of as of a physical law. The moral education of the man and his technical education as a soldier are the two levers which enable us to pull him away from cover and push him forward. It is not only difficult to do this but it is likewise hard to get him to move back when he has become thoroughly engaged. The disaster of Spion-Kop is explained on this principle. The duration of the fight, under these conditions, involves a great physicial strain on troops which is more a function of nervous tension than of physical effort. This enables us to understand the difficulty which troops have found in taking up their work the day after an attack or even the day after a success. Still more does it explain why the pursuit at the end of the fight has not been made." -(*La France Militaire.*)

OUR SECOND LINE OF DEFENSE.

BY GEN. CHARLES DICK (OHIO), *Chairman Committee on Militia, House of Representatives.*

OUR first line of defense will always consist of the Regular army, a small compact and highly disciplined body of officers and men ready at any moment for service of all kinds. There has always been in this country, and always will be, a strong prejudice against a large standing army, and while that prejudice is unfounded, and while there never need be any fear that our standing army will be used as an engine of oppression, or as a means to overturn the Republic and establish a military despotism, yet it should always be the policy of the country to restrict the size of the standing army to the smallest limits compatible with our actual necessities. Our present standing army is considerably below the maximum of

men authorized by law, and only recently the President has directed a further reduction in the force of over ten thousand men. When that reduction is accomplished, the Regular army will consist, in round numbers, of sixty thousand men. This force is scattered from the Atlantic to the Pacific, and from the Canadian frontier to the Rio Grande. A large proportion will always be engaged in manning the coast defenses of the nation and cannot be diverted for any other purpose. At least one-third of the army is engaged in the Philippines, and that condition of affairs may continue for some time to come. The Indian problem has been solved and conditions in our outlying possessions are rapidly growing better, so that there is no prospect of any further increase in the standing army, certainly not for years to come. If we could count on conditions of perpetual and universal peace, if that millennium had arrived of which the poets sang, then it would be unnecessary to make any other provision for National defense. Despite peace conferences, however, and talk of arbitration, human nature remains the same, wars are certain to occur again, and the Nation would be very derelict if it made no further provision for self-protection. * *

The consideration of prime importance in maintaining a high degree of military efficiency is a state of preparation which will admit of striking immediate blows at an enemy, of being prepared on very brief notice for manning our frontiers with a strong and effective force. Modern wars are short, sharp and decisive. They are not often preceded by formal declaration of war; nor is there time after war has once begun to arm, equip, discipline and perfect a large force. A statement before me shows that from 1700 to 1871, a period of 171 years, there are 107 cases recorded in which hostilities were begun in Europe and the United States without previous declaration of war. In the same period there are less than ten instances in which declaration of war preceded the firing of the first hostile shot. Wars are now generally decided in a shorter space of time than was necessary to prepare our Volunteer forces for effective service during the war with Spain. In the war between France and Austria in 1859 the battle of Solferino decided the contest in fifty-two days. In the war between Germany and Denmark in 1864 the contest was practically over in ninety-three days. The battle of Sadowa determined the result of the Austro-Prussian war in 1866 in seventeen days after hostilities began. The conflict between Austria and Italy in 1866 was settled by the battle at Lisa in thirty days after the outbreak of hostilities. The Franco-Prussian war saw its decisive contest at Sedan, which fell in forty-nine days. The war with Spain was practically over in 100 days. These instances show conclusively that to wage war successfully a nation must be prepared immediately to take the field with a force adequate for the first emergency. Our contest with Spain was not a fair test of the conditions of modern war. Spain was a third-rate power, without a large standing army, and afforded practi-

cally no test of what our experience would be should we ever unfortunately become engaged with a first-class military power. * *

The military resources of this country are practically unlimited. Its reserve powers are tremendous, perhaps the largest in the world. It may safely be said that within the boundaries of the United States there are between ten and twelve millions of men able to perform military service. Our financial resources exceed those of any other nation. No other nation can turn out as many arms and accountrements, uniforms and other equipment, in the same length of time as the United States. We are safe in saying that no nation could hope to over-run the United States and subdue the entire country, but of what avail are all these magnificent resources of men and material unless they are ready for immediate use in time for the supreme crisis? If a hostile army could land on our shores and capture even a few of our seaboard cities, the damage caused would be much greater than the expense of maintaining an adequate second line of defense. The safety of the country in time of danger must depend upon the Volunteer soldiers. It is the Volunteer soldier who has fought the great battles of the country, and our reliance must ever be on that branch of the service. In the days of our forefathers when every man was a good rifle shot, when the danger of Indian uprisings forced every man to be an expert in the use of firearms, when there were no telegraph lines and no cables, when means of communication were slow, and the length of a trip across the Atlantic ocean was counted by weeks instead of days, there was not the necessity for maintaining our Volunteer forces in a high degree of efficiency. Modern conditions have changed all this. Comparatively few men are trained to-day in the use of the rifle. The United States and Europe are in closer contact to-day than were Washington and Philadelphia one hundred years ago, and a foreign army could be mobilized and transported across the Atlantic in a few weeks. The various States and Territories maintain their own local military organizations, but they are National in name only, and the process of converting them into National forces is slow and tedious. Their armament and equipment vary. Scarcely any two of them have the same organization. Some State troops go into camps of instruction every year; some every other year; some do not go at all. The States which give adequate instruction in rifle practice are very few. Before the war with Spain it was very generally taken for granted that in most of the States the National Guard was fully armed and equipped and ready for active service. Not only did the public generally believe this, but many army officers of high rank testified to the same effect. How utterly mistaken were all these flattering opinions, our war with Spain quickly exposed. * *

During every generation since our Government was established the country has been engaged in war. Every such war has given most valuable information, based upon the teachings of stern experience, but not yet has the country been wise enough to take advantage of the

education thus acquired and make provision for the future. During the first year of his administration as President of the United States General Washington in a message to the Senate referred to the militia as follows: "Along with this object (the preservation of peace and tranquility on the frontiers) I am induced to suggest another, with the National importance and necessity of which I am deeply impressed. I mean some uniform and effective system for the militia of the United States. * * * I am particularly anxious it should receive as early attention as circumstances will admit, because it is now in our power to avail ourselves of the military knowledge disseminated throughout the several States by means of many well instructed officers and soldiers of the late war, a resource which is daily diminishing by death and other causes. To suffer this peculiar advantage to pass away unimproved would be to neglect an opportunity."

The only way to bring our National Guard up to a high state of efficiency is to pass a Federal law which will make them in fact, as well as in name, a National Guard, and which will insure their uniform equipment and drill. They should be armed and equipped just as the Regular army is armed and equipped, and they should have the same discipline and instruction so far as possible in the limited time that can be given for that purpose. State troops should go to camp under conditions as nearly as possible approximating those of actual war. State troops and Regular troops should be camped together, so that the former may have the benefit of the experience and skill of the latter. The Volunteer should bunk as the Regular bunks, should live on the same ration, and should prepare his meals just as the Regular prepares them under service conditions. Volunteer soldiers should be trained in carrying the same accoutrements that they would carry in actual warfare. The Government should make liberal appropriations for target practice. Aiming and pointing drills should be given to all Volunteers, and they should all be given an opportunity every year of firing on the ranges. Depots should be established for reserves of arms and equipment, and these should be so distributed throughout the country that there need be no delay in equipping a Volunteer force when called for duty.

This subject has been considered of sufficient importance to have the attention of nearly every President from Washington to Roosevelt. A great many of them have referred to it in their annnal messages, but the country has gone on in fancied security, indifferent to the lessons of experience. A measure has passed the House, and is now pending in the Senate, which it is believed will correct this evil. It has the approval of the President, and the Secretary of War, and of the National Guard of the different States and Territories. It will add very little to the present expense, but will within a short time give us a highly trained and efficient Volunteer force, ready to take the field at once. It will be directly subject to the call of the President, but will be officered as now by the Governors of the States. The men will be physically examined be-

fore admission to the ranks, thus insuring sound bodies, a condition which has not prevailed heretofore.

Officers will be examined as to physical and mental qualifications, and the standard will be uniform throughout the country. Those not fit to serve will not retain their commissions, but they will be afforded opportunities for improvement and making themselves qualified to serve by being permitted to go to Regular army schools for instruction, and while there their expenses will be paid. Annual inspections by officers of the Regular army will test the efficiency of the Guard, and the pro rata allotment due each State from the annual appropriations of Congress will be given to those States whose National Guard is sufficiently armed, uniformed and equipped for active duty in the field.

The present National Guard of the States and Territories aggregates about 115,000 officers and men. With liberal appropriations by Congress, and a system of Federal control and instruction, the States also will be induced to accord more liberal treatment, and this force will in a short time doubtless reach 200,000. Of this number it is believed at least 150,000 would respond to a call for duty. This would be amply sufficient under all contingencies which may reasonably be expected, for the second line of defense, and would give the country breathing time within which to organize and equip its vast unorganized military resources.

With a Volunteer force of this size, so equipped and disciplined that it could take the field at once, it would be possible to even further reduce the size of our Regular army. It would be a body which would inspire the respect of other nations, and make them hesitate to wantonly attack us. The country would be far better prepared for war, while at a minimum of expense we would be able to secure to the country a maximum of our military strength in times of great emergency.

MILITARY EDUCATION.

(United Service Gazette.)

DR. T. MILLER MAGUIRE, LL.D., lectured (July 4) at the Royal United Service Institution, on "The Past and the Future of British Military Education from an Imperial Point of View." General Clive presided over a large attendance. Dr. Maguire observed at the outset of his lecture that every one of the recommendations of the report of the Committee on the Education and Training of Officers had been promulgated and discussed for years at the Institution and reported on in its "Journal," even as the so-called lessons of the recent South African War were anticipated in the Institution for three years before it took place. But neither the official classes nor the richer classes paid the least attention to warnings until it was too late.

He had pleaded the cause of efficiency in education for years, but in vain; and teachers of his kind had been persistently ignored and abused. The education question was now before all parties, and the general opinion prevailed that if the British nation did not forthwith proceed to set its educational house in order, especially with regard to secondary education and technical education, bad times awaited the nation. He urged the absolute necessity of secondary education in the interests of military and all other branches of education. The education of officers had only been like that of the average members of the upper and middle classes. The great mass of the prosperous and ruling classes of the English disliked learning and deprecated its professors. Military education for the past generation had only stereotyped their tastes. But every leading soldier, British or foreign, had been a strenuous advocate of general knowledge, which was more useful to soldiers than to anyone else. A great deal of rubbish had been talked about our so-called national games and their elevating influence on national life. Our leading soldiers, politicians, or administrators had hitherto never played any games of ball after the age of 17; their tastes were bound up in the acquisition of knowledge, and their relaxations were manly exercises—riding, etc., and never were games. The cult of games at schools and among the public was a sign of degeneracy, and its degrading development was not half a century old. He denied that Waterloo was won on the playing fields of Eton, or on any other playground; and the famous remark attributed to the Duke of Wellington was never uttered by him. The remark, however, was used by the pedants who had ruined the education of our so-called better classes as a text justifying their neglect of mental instruction of any kind. Personally, he was in favour of every manly accomplishment—riding, fencing, rowing, boxing, gymnastics, and all open-air sports. But he held also that the mental faculties were as worthy of attention as the muscles, and that no skill in cricket or football was a compensation for complete ignorance in every branch of learning. At the age of from 18 to 20 well-trained memory, imagination, judgment, as well as thew and sinew, made the perfect man. He was in perfect agreement with all General Tulloch's remarks at the Royal United Service Institution as to the lamentable condition from an educational, as distinguished from the merely instructional, point of view of the young men of the richer classes at the present day. Even if the great Duke had been so ill-advised as to use the phrase with which he had been wrongfully credited, he would no doubt have apologised at once if the matter had been brought to his attention. The non-commissioned officers, who were the backbone of his army, had not had the advantage, or otherwise, of a public school education. The Scotch and Irish gentlemen of his army belonged to families that then eschewed public schools, and, indeed, boarding schools of any kind; and they were wise. Not one of the leading generals of the Peninsular and Waterloo campaigns owed his

physical, moral, and intellectual training to the leading public schools or to games. The same might be said of other great soldiers since. Lord Wolseley, Lord Roberts, Lord Kitchener, Lord Milner, and Mr. Chamberlain had been hard-working men all through their lives. The folly of keeping our young men loafing and playing and learning nothing at school from 16½ until 18½ years of age, was quite unknown to our upper classes at the end of the eighteenth century. Young people should work hard as well as play hard between the ages of 14 and 19; if they did not they would rue the consequences. Our officers were at work at that age 100 years ago; many were on active service at the age of from 17 to 19, and if this could not be, at any rate not one man of the whole galaxy was playing cricket in any school field at that age. If not serving in arms they were at military schools at home or abroad, preparing for their career. One of the lessons of the late war was the danger of trusting to either new riches or to education based on any other motive than the promotion of capacity, efficiency, and wisdom. If the war had not taught that lesson our ruin was at hand. After remarking that snobbery, jobbery, ignorance, and red tape were still triumphant, he said that the true lessons of the war and of every war were set forth in the "wisdom of the ancients," which could only be appreciated by persons who were not only well instructed, but educated from their mother's knees. Mothers of the old-fashioned British type were very badly required in England. The education of their children was the first duty of parents. At the present time the average English public schoolboy was far inferior in every respect to the Scotch and Irish or American schoolboy; indeed, he was no use at all, and in a hopeless state, unless his father was well off. It was a national and Imperial disgrace that such reports as those of the staff at Aldershot of October, 1900, and of the recent Commission were possible. The fact showed that the cult of ignorance by British soldiers was a recent monstrosity, and that the worship of boyish games by grown men was utter frivolity without any basis in the experience of mankind.

A FAMOUS BELL.—An ominous crack has just been discovered in one of the most famous bells in the world, the so-called "La Clémence," in the Cathedral of St. Peter at Geneva. It is the bell which was sounded at the "Escalade" of the dark night of St. Thomas's day, December 21, 1602, when the 8000 Savoyards made their attack upon the "Rome of Protestantism." The assailants had crept close to the fortifications unobserved, and had planted their ladders, the Jesuit missioners exhorting them in whispers, "Climb, climb! every rung of the ladder is a step towards heaven!" when the loud clanging of La Clémence was heard, calling the citizens to arms, and Geneva was rescued. The Savoyards were driven back, and the aged Theodore Beza called the people into the cathedral, where they sang the one hundred and twenty-fourth Psalm. From 1602 to 1901, on every December 21, the now silenced bell has been rung in memory of the "Escalade."—*Westminster Gazette.*

THE BLOCH MUSEUM OF WAR AND PEACE.

THE BLOCH MUSEUM OF WAR AND PEACE.

(L'Armée et Marine.)

ON the Seventh of June, at Lucerne, there was inaugurated the "Museum of War and Peace," founded by the late Counsellor of State, Jean de Bloch, in the presence of Counsellor of State Henry de Bloch, his son; his family; Mme. Bertha de Suttner; Messrs. d'Estournelles de Constant; William Stead, of London; Jules Roche; General Duerr, etc., etc.; also delegations from the Cantons and municipalities; and a number of members of the Council of the Swiss Federation.

M. de Bloch delivered the address of welcome, stating the objects of the Museum, and recalling, in simple and touching words, the manner in which the work, as it stands to-day, was completed. The most of those who heard him knew this history, but for us, the name of Jean de Bloch, was a new name, when, four years ago, the celebrated writer came to us to present the translation of his book.

Very well known in Russia and Poland as a builder and administrator of railroads and as a banker, Jean de Bloch had come to understand the ruinous consequences of war, from an economical and financial standpoint. The enormity of these consequences so impressed him, that, after having minutely studied them and figured them out, he had the curiosity to take up the entire problem; to understand and explain what war really means; how it is made to-day; and how it threatens to be made to-morrow. From these successive investigations, from this experience drawn from history and from his facts, there was deduced by him, little by little, the conviction that war, becomes more impossible the more its science is perfected—impossible because ruinous—and that the moment had come for governments and peoples to see that there was no war, however happy, however triumphal the denouement, which was worth, to the conqueror himself, the trouble of having carried it on, and the price which it had cost him.

This is the demonstration that he resolved, in 1895, to undertake at the price of a truly formidable work of documentation.

The work fills six large volumes, which, written at first in the Polish language, were successively translated into Russian and German.

The conclusions of the work alone fill a quarto of five hundred pages.

It was these conclusions that Jean de Bloch—while waiting for the entire work to be translated into French—brought to us at Paris four years ago.

The translation was finished in about a year, and meanwhile an important group of political gentlemen, diplomats, economists, savants, etc., interested themselves with us, very actively, as apostles of Jean de Bloch.

In the following year he was found at the Peace Conference at the

Hague; afterwards at various conferences here and there, at London and Paris.

He was then sixty-four years of age and suffered from a malady of the heart. To all the efforts of his friends, who urged him to take a rest, Jean de Bloch replied, "I have no time to rest, it is still necessary that I should do something."

What he wished to create was a museum. His dream was to bring together under his own eyes, as a vast object-lesson, all the elements of the formidable documentation, from which his work had sprung; he dreamed of teaching men the love of peace, of showing them (after having told them) what war really was at bottom.

His desires were to install this museum at Paris, at the time of the Exposition. He did not succeed, and then it came to be established in Switzerland.

The people of Lucerne gratuitously placed at his disposal for ten years, the grounds and immense building, in which their last Federal target practice had been held; and he was preparing it, and installing therein his collection, when he found himself dying. He had only time to confide his work to his son and to receive from him his promise to continue it. This promise Mr. Henry de Bloch fulfilled a few days ago, and he applied to Mr. Frederic Passy, another "Apostle of Peace," for its inauguration.

The monument, at the entrance to which is seen a bust of Mr. Jean de Bloch, is to-day almost complete, and is arranged in the most ingenious fashion.

The centre of the immense rectangle where the collections are displayed is occupied by a gallery in which are alligned ten dioramas of very interesting execution; they are of episodes in modern war, intended especially to enlighten us on its *aspects*. From the two sides of the dioramas open the exhibition halls where the *processes* of warfare are, in some fashion, told by objects and by documents—ancient arms, old time projectiles, plans in relief, models of fortifications, battle formations, nothing has been forgotten. I have already said that one room —the largest—was intended to make us acquainted with all the types of modern military engines of destruction. In another room there have been collected photographs which instruct the visitors in the exact effects of this destruction! Finally, we come to one of the most curious collections of the museum: that in which Jean de Bloch, by graphical methods, by statistical tables, by images, has endeavored to have impressed upon the eye, without effort, the idea of the evils, the view of the disorders which a great war would turn loose on the lives of the people, if declared to-morrow—all this with a clearness, with an ingenuity most striking.

In the originality of this work is bound the reason for which the house, wherein this instruction is to be found, carries over its door the paradoxical title—"Museum of War and Peace."

THE WORLD'S FIGHTING WOMEN.

(*London Globe.*)

REAL fighting women are not rare in Dahomy and various other savage countries—indeed an old chief of Tonga found no difficulty in bringing a thousand women face to face with an equal number of their own sex and getting them to fight it out just for the fun of the thing—but in civilized lands born fighters of the female sex, in spite of Joan of Arc, are comparatively rare. When we meet a woman fresh from the fray with ten little streams of blood coursing in nicely hollowed channels down her face, we know that she has just returned from a meeting with such a one and has come off second best; but this is only among the wholly uncivilized criminal classes, and it is proposed to treat here more particularly of women who, being well civilized, even accomplished and refined, have fought in battle and in duel.

In some instances women have stood by their country in formidable numbers. As an instance of this might be mentioned the case of the Chinese Rebellion of 1853, where among the rebel army in Nankin alone there was about half a million of women soldiers drawn from various parts of the country and formed into brigades of 13,000 under female officers. Ten thousand of these were picked women, drilled and garrisoned in the city; the remainder were set to all kinds of drudgery, such as digging trenches and moats and erecting batteries. But instances of this kind of thing are few and far between unless we enter into a consideration of regular savage Amazondom. For the most part the fighting tendencies of women have been restricted to isolated instances. A remarkable case in point is that of Christiana Davies, otherwise known as "Mother Ross," who, in the early part of the eighteenth century served, in the disguise of a man, in the 2d Dragoons, now the Scots Grays. She began her warlike career in early years by running a sergeant through the leg with a spit because he and his fellow papists were blocking up the entrance of the church with lumber while her mother was inside. On this occasion, having disposed of the sergeant and a few more, she removed the obstacles and summoned her mother to dinner, which had been getting cold meanwhile. From this beginning she began a very soldierly life. Her husband having been pressed into service, she, thinking to find him, provided for her two children, cut off her hair, donned men's clothes and enlisted.

Shortly afterward Christiana had to face shot and shell in the battle of Landen, and was wounded in the leg. After some weeks in hospital, during which time her sex was not discovered, she resumed duty and, among other details of romance, placed herself in an awkward position by winning the love of a local citizen's beautiful daughter, and, to make matters worse, was involved in a duel with a sergeant of the same regi-

ment on a question intimately connected with this same fair one. She wounded the sergeant and was duly imprisoned. This only made matters worse, for the burgher's daughter pined and it was with considerable difficulty that Christiana temporized by saying that it could never be, at least not yet, for she was but a poor foot soldier; some day, perhaps, when she had worked her way up to a commission, she might be bold enough to claim her. This brave woman passed through the seiges of Nomur and Venloo, and was also at Nimeguen and at Schellenberg. At Blenheim she was allotted the task of guarding the prisoners, and there by accident she met her husband. Already twice wounded, she had her skull broken by a fragment of a shell at Ramillies, and here for the first time her sex was discovered. It was the signal for universal amazement. Her Colonel, Lord John Hay, did all in his power to show his opinion of such bravery in a woman; Brigadier Preston presented her with a new silk dress, and when this was done, the regiment insisted on marrying her and her husband over again to the tune of many wedding presents.

Women who have served their country in time of war have not been very numerous. Among them may be reckoned Phœbe Hassel, whom for many years George IV. allowed a soldier's pension of half a guinea a week. Her history in brief has been discovered on an old tombstone at the head of her grave in the churchyard of St. Nicholas, in Brighton. The inscription runs as follows: "In memory of Phœbe Hassel, who was born at Stepney in the year 1713. She served for many years as a private soldier in the 5th Regiment of Foot in different parts of Europe; and, in the year 1745, fought, under the command of the Duke of Cumberland, at the battle of Fontenoy, when she received a bayonet wound in the arm. Her long life, which commenced in the reign of Queen Anne, extended to the reign of George IV., by whose munificence she received comfort and support in her latter years. She died at Brighton, where she long resided, Dec. 12, 1821, aged 108 years." * *

Of the Chevalier d'Eon, who was a lieutenant of Dragoons in the French Army, and of Jean of Arc, it is scarcely necessary to speak, but there are yet a few less widely-known women who deserve to be remembered. Eleanor Job, who, in the first war with America, was attached to the Flying Hospital as a nurse, was more of a fighting woman than a flying nurse. Jeanne de Belville, who, in the fourteenth century, fitted out a fleet of ships, and, in revenge for the murder of her lover, burned a whole coast line of villages, was of the stuff from which punitive expeditions are made.

MILITARY NOTES.

CAVALRY HIGH JUMP RECORDS.—Brilliant displays of horsemanship were given at the recent international cavalry contests held at Turin, which were attended by the King of Italy, and were a great success. Most of the European armies sent their best riders to represent them. The Piedmontese cavalry have long been traditionally famous for equestrian feats, and to Italian riders fell the honors for the high and broad jumps. Captain Caprilli, riding Melopo, a horse belonging to Cavaliere Jean de Giovanni, made the best high jump, clearing two mètres eight centimètres, or six feet eight inches. It was claimed that this made a new world's record, the previous record of one mètre ninety-six centimètres having been achieved in Belgium, and then in France.

Though the jump may be entitled to all the applause it received as the performance of a military trained horse and rider, the height was easily surpassed last November at the Chicago Horse Show by the horse Heatherbloom, a big bay gelding, owned by Mr. Howard Willets, of New York.

Heatherbloom, when put to the test, cleared seven feet nine inches with ease, thus establishing a world's record that has not been beaten so far as official records show.*

* In sending the photo, of which the above illustration is a reproduction, Mr. Willets writes that "in practice, 'Heatherbloom' has jumped over 8 ft., and I look for him to do 8 ft. 6 in. this year."—[Ed.]

IN MEMORY OF STEUBEN.—That nations and great peoples are too apt to forget their heroes, too apt to forget the great men who assisted in laying the foundations of their countries, is shown by the fact that, now that an effort is being made to give tardy recognition to the services of Baron Steuben, people are asking who he was and what he did. Congressman Bartholdt of Missouri has introduced a bill appropriating $50,000 for the erection of a statue to the memory of Steuben, the statue to stand in Lafayette Park as a companion piece to the monuments reared there to the memory and honor of Lafayette and Rochambeau. The statue of Lafayette stands in the centre, with Rochambeau on one side, where the monument was recently unveiled with great international ceremonies, and it is the intention to complete the trio, and place on Lafayette's other flank the memorial of Baron Steuben.

Baron Steuben, though a native of Prussia, came of the aid of the American colonists practically accredited to France. Benjamin Franklin was in Paris seeking a man who could enter the American army, and establish the discipline and order which was then so much needed by Washington. Franklin could not guarantee Steuben's expenses, but where his heart and his sword went Steuben's fortune went also, and he sailed at once for America, paying his own expenses, and finally impoverishing himself for the benefit of the suffering soldiers in the half-clad and poorly fed army of the colonists. Steuben took the tattered and disordered remains of Washington's undisciplined army and adopted the general plan of drill and discipline that is still in use in our army to-day, and that has made American arms famous throughout the world. While others led he was the drillmaster who furnished the men and pointed out how they should be used. New York and Pennsylvania made grants of land to Steuben after the war, and after many years Congress finally reimbursed him in a miserly way for his losses, but Baron Steuben gave many times over what he received back, and gave it with his heart and sword thrown in. The memorial is tardy, and American historians ought to hang their heads in shame that Steuben has such a small place in their writings.—*Iowa State Register.*

EFFECT OF WAR UPON THE BIRTH AND DEATH RATE.—War not only influences the mortality of the army in the field, but has a maleficent effect on the birth rate and death rate of the country which is fighting. A low birth rate may be explained, to some extent, by the fact that when a nation is at war, her people at home are less prosperous, and, consequently, marriages are not so frequent.

The increase of the death rate occurs, probably, for the reason that food is scarcer, and also because at a time when a country is engaged in a disastrous war, the minds of its inhabitants are adversely affected. Those who are in delicate health, or who are attacked with sickness succumb much more readily when the spirits are low, than when in a normal condition. It is, indeed, the reaction of the mind upon the body.

The returns of the Registrar-General of Great Britain of births, marriages, and deaths for the year 1900 demonstrate the potency of the influence of war upon the birth and death rate.

The births in 1900 numbered 927,062, or a rate of 28.7 per 1000, this being the lowest on record, and 1.3 per cent. under the mean rate of the past decade. The illegitimate birth rate was also the lowest on record.

There were 587,830 deaths, or 18.2 per 1000, as against 17, 17.4, and 17.5 in the previous three years. The number of deaths directly due to alcoholism was 3683, while the death rate from this cause was 132 males

and 95 females per 1,900,000. These rates constitute a highest on record. Tuberculosis claimed 61,302 victims, or a death rate of 10.4 per cent. of the deaths from all causes. The death rate of the army was 27.6 per 1000, as compared with 10, 12 and 10.5 in the preceding three years. The mortality rate in the army abroad was 36.1 per 1000, as compared with an average of 14.5 in the past five years, and the death rate at home was 8.2, as compared with an average of 4.3 in the previous five years.

Thus it will be seen that war drains the life blood of a nation. Nothing is said in the above returns as to the action war is asserted to have on the production of sex. On the authority of German scientists, it has been declared that the females of a nation at war are apt to give birth to a much larger number of males than is ordinarily the case.—*Medical Record.*

WALTER SCOTT AS A VOLUNTEER.—The recent discovery in Edinburgh of a summons calling upon Sir Walter Scott, advocate, to attend and join the Edinburgh army reserve during the troubled period of 1803, has been followed by the unearthing of Scott's reply. Dated from Lasswade Cottage, July 22, 1803, and addressed to Mr. James Laing, clerk to the lieutenancy of the city of Edinburgh, the letter reads as follows: "Sir—As I observe by the enclosed summons that I am drawn a soldier of the army of reserve, I beg to inform you it is my intention to claim the exemption provided in favor of volunteer cavalry, having been for twelve years a member of the Edinburgh troop of the R. M. Lothian V. Cavalry. I understand from Col. Dundas that the adjutant, Mr. Adams, is to supply the lieutenancy with a list of the corps, in which you will find my name regularly inserted. If further verification of the exemption is requisite, have the goodness to acquaint Mr. Adams or me. I remain, sir, your obedient servant, Walter Scott." In spite of his lameness, Scott was an enthusiastic—and immensely popular—volunteer, and used to turn out to drill at five in the morning.—*London Chronicle.*

CROSSBOWS IN TWENTIETH CENTURY.—Many persons in Europe, and especially in Switzerland, now practise constantly with crossbows, but it is a mistake to suppose that they use the same kind of weapon as that used by William Tell.

This improved crossbow was invented about twenty years ago by Colonel Bollinger, a Swiss, his object being to fashion a weapon which could be used at night against an enemy's sentinels without attracting attention.

This Swiss crossbow is worked by a lever. The arrow is of linden wood, and is 165 millimetres in length and about fifteen millimetres in diameter. It is tipped with iron, over which is a brass ferrule, and the wooden shaft is of an ovoid form in front.

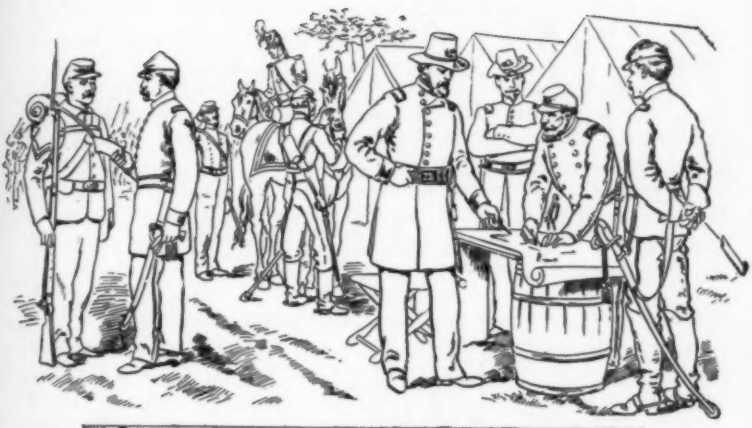
Constructed in this way, it possesses the double advantage of opposing to the air the least possible resistance and of compelling this resistance to communicate to the shaft a rotary motion during flight.

The initial speed of the arrow is not exactly known, but at a distance of seventy feet it will penetrate a wooden target to a depth of three centimetres.

WHY DE WET AVOIDED THE HIGHLANDERS.—De Wet is possessed of humor, says a South African correspondent, writing to a contempor-

ary. One of the leading camp officials (in a certain refugee camp) is a Scotsman, who during the dinner, took occasion in offering the General a drink to say he must have got a fair amount of whiskey among his captured convoys. De Wet was much amused at this, and on referring to it subsequently said that before attacking a convoy he made inquiries if they were guarded by Scotsmen. If this were so, he further inquired if it contained any whiskey. If the second condition accompanied the first, he always gave the convoy a wide berth, because he knew the beggars would fight to the last man! The Scotsman replied that he would write home and inform his countrymen of this important element in scouting and in defensive warfare—a remark which set him into roars of laughter.—*St. James's Gazette.*

JAM FOR THE BRITISH ARMY.—A curious feature of the war has been the discovery of jam by the British soldier. To judge from Mr. Brodrick's printed reply to a question in the House of Commons, jam has leaped from the rank of a household delicacy to the position of a military necessary, without which a campaign can hardly be conducted to success. 34,582,762 pounds of jam were consumed during the war by the army, most of it manufactured in this country, the rest of it in the colonies. It is computed that in the year 1900 alone thirty train-loads of jam, at 300 tons to a load, were sent to the front; and that the army consumed more than half its own weight of jam in that time. —*London Daily News.*



Comment and Criticism.

"Notes on Transportation."*

Lt. Colonel James Regan, 9th Infantry.

The paper of this young officer touches upon an extremely important subject in the Art of War, quite as important as strategy and tactics. I doubt, however, that it ever will receive the serious attention it deserves. To attain in war what this paper suggests, "prompt, systematic and sufficient delivery" of supplies, we must have a well defined practical system worked out in peace based upon the experiences of war; data for this we have in abundance, but who can devise a system to steer clear of conflicting interests? Yes, a *supply department* suggested in this paper and so often suggested before, and very recently by our present Secretary of War, is the first and prime essential. The following descent of power as shown by the diagram ought to do away with conflict of authority and attain the best results in War:

Military Advisers. { President. / Secretary of War. / General of the Army.

Supply Department

embracing the various corps and departments as they are now organized.

* See "Notes on Transportation," etc., by Lieut. Baer, p. 623.

"Loose Leaf Company Record."

Captain W. C. Brown, 1st Cavalry.

This novel method appears practicable on its face and if found equally so upon actual trial would save an immense amount of clerical labor.

After studying it over, carefully, I am tempted to suggest that the form be printed in bold-faced type on one side only of thin but tough semi-transparent paper, a paper which will admit of erasures, and that all entries thereon be make in liquid India ink.

Upon enlistment the original copy would be prepared in India ink, blue print copies being made for the Adjutant General, for file at the rendezvous or wherever required. The original would be forwarded with the man to his regiment.

When he is temporarily separated from his company a blue print, facsimile, copy can be sent in lieu of the Descriptive List now furnished, on which copy will be entered by the new commanding officer, all data concerning the man until his return, when it will be copied on the original. Upon transfer, the original will go with the man, a blue print copy being retained for file in his old company. Upon the man's discharge from the service a "blue print" copy of his sheet should be kept in the troop and the original forwarded for file in the Adjutant General's office, where the man's entire history for a full enlistment would appear in a convenient form for future reference.

Where no facilities exist for making "blue prints," copies in manuscript can be prepared.

Those of us, Company Commanders who, with inexperienced, inaccurate, and otherwise indifferent clerks are fairly snowed under with paper work at the end of each month, will say give Captain Patterson's idea a trial—indeed, give anything a trial which affords fair promise of relief from the enormous amount of paper work now required.

Blue prints for copies are suggested for the reason that by such means time is saved, unskilled labor can be used, and the copies are absolutely accurate.

"Combined Army and Navy Operations."

Lieut. Col. James Regan, 9th. Infantry.

In the recent operations in China, in which the most powerful nations were combined against that country, a very weak power comparatively, in the efficiency of its land and naval forces, great difficulty was experienced in disembarking troops from transports, anchored as they were, about twelve miles from the mouth of the Peiho River, and about fifty miles via river to Tien Tsin, the final point of disembarkation for the Americans. The American transports were the last to arrive in the Gulf, and nearly all the means of marine transportation, lighters and tugs, had been seized by the other nations, except the few under the

control of our Navy. Every effort was made to hasten the landing of our troops by means of surf-boats, transport tenders etc., but against a strong enemy, our landing under the circumstances could never have been effected. The landing of troops upon hostile soil, must in these days, be one of the most difficult problems, notwithstanding our great success in recent wars against two weak nations, and the historical fact cited in this paper. It seems to me that this problem requires the greatest study and practice with ways and means, which must be carried on the vessels. Perhaps we may never be called upon to land on a hostile soil, but to resist a landing, and yet we may as we have already done several times.

In view of the time given in this paper for the conversion of merchantmen into transports, we must have been woefully behind in the gathering and converting our merchantmen at the beginning of the Spanish War, when time was of vital importance. We did not have any defined system of transport service then, or understanding with our great lines of merchantmen. A decided system, controlled by law, is needed, and such able papers as this one, ought to bring it forth. Let us not wait until war is on us, and then rush into every port to get any kind of an available steam vessel.

The rule of command specified in this paper is a good one. It does not seem right, as was the case at Tien Tsin, that a Marine Officer, whatever his rank, should command the Army.

Reviews and Exchanges.

West Point—Past and Present.

THE Introduction to this volume * is an instructive opening to a bright story of cadet life and army service. It covers a broad field, contains much valuable information When we consider how condensed it is we feel that the work is in the hands of a judicious and competent historian. The book is certain to be of interest to all who are graduates of the Military Academy and to many also who are interested in the Army at large.

One may read it as a narrative of personal experience—it is interesting and historical, or he may turn to any chapter at an odd moment. It will be found bright and amusing—at times touching particularly so if the reader has been an active participant in the event of '57-'65.

The writer was an instructor at West Point from 1857 to 1861 when he left as an officer of the West Point Battery under Lieut. (Gen'l.) Charles Griffin. This battery became Battery "D" 5th U. S. Art'y. and served as such at the First Bull Run, and with the Army of the Potomac until 1865, but it was always to us the West Point Battery. Every man in it was linked to West Point by family ties. The horses were the horses used by the cadets—the very horses Col. Farley speaks of—"Quaker" as usual seeking the unusual, carried off a mass of iron from Manassas to Centreville and then dropped dead like a gentleman. But read it—it is all true.

The chapter on "Plebes and Discipline" is excellent. It is time to claim great merit for the methods and customs of those days—the fifties from the Mexican War to the Rebellion. Hazing was not brutal then, but there was plenty of it—no one was hurt. Duty was understood by officers and cadets. You could not take offense at a man's doing his duty, but persecution was resisted. For this purpose Kosciusko's Garden was sought. Then was the final appeal. Many a quiet old officer can tell you now that he visited that garden indeed frequently for a short period, and settled matters with older cadets to their mutual and lasting satisfaction. No one alluded to it. It was a matter of course, a safety valve.

* *West Point in the Early Sixties:* With incidents of the War. By Joseph Pearson Farley, U. S. A. Pafraets Book Co., Troy, N. Y., 1902.

Our Instructors—an honest tribute to gallant worth. They were picked men and wisely selected. After 1861 they were called to high positions.

Every man of them was a prominent officer in 1865.

The writer taught Custer, saw much of him during the war, loved him and admired him. You can hardly write concerning West Point from 1857 to 1861 without recalling Custer's individuality and enterprise. What a valuable officer this restless youth was to become. Whether aide-de-camp or regiment or brigade or division commander, it was gallant, enthusiastic, lovable Custer.

The book contains affectionate tribute to Reynolds and Griffin, McCook, "Bull" Williams, Field and Fitz Lee. Well deserved it is.

You can hardly review Farley's book without telling the whole story. He tells the story of his own experience in the War of 1861–5. It is well to read it. You will enjoy it as history; you will be interested in those with whom Col. Farley served. His view of matters is worth remembering, and when we add to this the thought that he was the classmate of many men who, like General and Professor Peter S. Michie, have passed into history, recognized men of talent, patriots, soldiers and beloved friends, we feel like saying: I am glad Farley wrote it. 1851–55.

Life at West Point.*

By H. Irving Hancock—will be a safe guide book for the young man who dreams of cadet life as the life most to be desired by the ambitious young men of the country.

It is a clear, correct, view of the life of a cadet. No one could tell this story without causing the candidate to despair of success, but it can be written and read and reread until the aspirant for military glory will be rendered better fitted for the life—the new and strange, and strenuous life of the cadet. It is a useful book for any one who really wants to understand cadet life as it is, and as such a book it will be read, by those interested, as an authoritative book should be read. 1857.

Great Commanders—General Forrest.†

This is the record of a remarkable man, during four years of war and adventure. It presents, perhaps unintentionally, the hero more in the light of a partisan than a general in a great army, and perhaps this is the true position to assign to General Forrest. There can be no question of his ability to fill either rôle, but his inclination seemed to have been for the first. Captain Mathes writes from the standpoint of an ardent admirer, which it is thought sometimes colors his opinions, statements and conclusions. The fact remains, however, that nothing short of positive military genius would have enabled Forrest to gain the succession of brilliant victories he did, often against considerable odds.

He was great, not only in strategy, but in battle tactics as well. A good illustration of his grasp of the latter was shown at Brice's Crossroads, and it is strikingly evident in most of his engagements. Was he as good a subordinate as he was a leader of detached forces? It is thought not. This is indicated by his differences with Wheeler and Bragg, and it is difficult to avoid the conclusion that his efforts at Harrisburg in July, 1864, in support of General S. D.

* *Life at West Point.* By H. Irving Hancock. G. P. Putnam Sons. N. Y. 1902.

† *General Forrest.* Great Commanders Series. By J. Harvey Mathes. D. Appleton & Co., N. Y., 1902.

Lee, were not as able as his previous independent actions justified his commanding officer in expecting. The language he is said to have used to General Bragg after the battle of Chickamauga was not only insubordinate, but highly insulting, and it is not understood how Bragg could have overlooked it, either as a man or a general, unless he thought Forrest, who had rendered great service in the battle, was temporarily not himself. No matter how important an officer's services may be, a commanding general cannot permit such insubordination to go unpunished and maintain efficient discipline. His part in the said battle well illustrated his capacity to act as a subordinate when he chose, but it was as a leader of a small and independent cavalry force that he showed to the best advantage. Vigilant, brave, tremendously industrious, and filled with audacity, he was ever ready to strike and dare, and he possessed the rare quality of transmitting to his followers his own spirit of battle. He never underestimated himself, or overrated his enemy; he never thought the foe less wearied than his own men by like exertions, and these qualities have gained most of the victories recorded in history.

In view of the affair at Fort Pillow one wishes he had never made the threat he so often did, that he could not be responsible for the consequences, if his demand for surrender was not acceded to, but fortunately there is much evidence to show he was generally a kind hearted man, and his threats did not really mean what they implied.

Although his command never much exceeded 5000 men, there is no doubt he was equal to a greater one. History presents no superior as a free lance. His services were brilliant, but it may be doubted if he was serving his cause to the best advantage in those bold and lightning-like strokes in West Tennessee while the fate of the Confederacy was being decided on other fields by the main armies of the North and South.

His advice to his soldiers on their surrender at the end of the war was patriotic and noble, and worthy of his greatness.

His campaigns are a marvel of thought, rapidity and dash that may well be studied by every officer of the United States Cavalry.

E. J. McCLERNAND.

Company Commander's Manual.*

The convenient size, completeness and systematic arrangement of this little book will commend it to company commanders. The latest regulations have been gone over thoroughly, and all that pertains to a company has been rearranged in a small volume scarcely larger than an Infantry Drill Regulation.

This work is quite in line with the present tendency—that of reducing and simplifying the paper work of the army. If some of the excellent suggestions made in the columns of the JOURNAL, be adopted, a company commander will find that he can take the field with a greatly reduced amount of desk impedimenta.

Still it is questionable if a company commander can ever afford to be separated from his official copy of the regulations. So many points arise other than those strictly pertaining to a company, moreover, the regulations of 1901 have been so modified by general orders that files of these orders must always accompany the regulations.

* *Company Commander's Manual of Army Regulations.* By Lieut. W. H. Waldron, 29th U. S. Inf. Hudson Kimberly Pub. Co., Kansas City. 1902.

Lieut. Waldron's book is not, therefore, strictly up to date, but no more is the official copy of the Regulations, unless kept so by its possessor.

The "Manual" will be of great assistance to inexperienced company commanders in enabling them to turn at once to the proper paragraph. The various forms, with explanations thereof, which will be found in this little manual, will be of great assistance to those officers who have not had previous experience with these matters.

Altogether, the book is a valuable contribution to the needs of the service and shows great care and good judgment in its compilation and arrangement.

ARCHIBALD CAMPBELL,
Captain Artillery Corps.

Studies in Map Reading and Field Sketching.*

Lieut. Col. Wilkinson J. Shaw, P. S. C. M. A., has, in his little volume "Studies in Map Reading and Field Sketching" given to the military world a concise course of instruction in those matters, which, by his method, he renders so plain and simple that the knowledge seems to come to the student by inspiration.

He further takes from the study its dry and prosaic character by editing his work in narrative form, making it a story of seven days doings of the writer, and a few seekers after topographical knowledge.

The explanation of the needed instruments is clear, and the manner of demonstrating their use, throughout the narrative, is so plain that it can be grasped by a novice. His day at map reading reveals to the student information which, formerly, he had not imagined lay concealed in the lines and figures, and his subsequent days in the field, with a few simple instruments makes plain how really a science of common sense is the plotting of a landscape.

Col. Shaw does not pretend to teach accurate surveying in this little volume, but the student who follows the methods laid down by him will certainly construct a field sketch on which it would be safe to base military movements.

E. E D.

The Cavalry Journal.†

The JOURNAL OF THE MILITARY SERVICE INSTITUTION welcomes to its exchange list the familiar face of its old auxiliary, the *Journal of the U. S. Cavalry Association*.

While opinion is divided as to the wisdom of attempting to maintain a number of periodicals, each limited to the literature of a single branch of service, rather than to concentrate the professional ability and encouragement of our officers upon one or two publications devoted to the interests of the Army at large, yet the revival of the cavalry organ indicates a healthy condition of professional thought and a keener appetite for military study than appears to be possessed by some of our transatlantic friends. On this account, the new venture of the mounted service has our best wishes and we shall observe with interest its progress in promoting the fortunes of a branch of the Line which has so glorious a past and so promising a future. That the operations of our Cavalry have at last attracted the attention of foreign military experts is shown by the interesting translation from a French contemporary of which the third and concluding instalment appears in this number of our JOURNAL. T. F. R.

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* D. Van Nostrand Co., New York. 1902.

† *Journal of the United States Cavalry Association*, Capt. L. C. Scherer, 4th Cavalry, Editor. Published Quarterly. Fort Leavenworth, Kas., July, 1902.

Our Exchanges.

Military.

Armée et Marine.—June 29. The Naval War in the Argentines, 1902. Inauguration of the War-Peace Museum. A Tour of Inspection of the Forts by Automobile. A French Officer's Impressions of Spain. Installation of the New Commandant of the Higher War School. July 6.—The Rochambeau Mission to the United States. July 13.—The Rochambeau Mission, etc. (Conclusion). The French Mission in Italy. The Defense of Our Colonies. July 20.—The Battalion of the Finland Sharpshooters. Infantry Marches. Export of Fire-arms. Medals for the Army and Navy. July 27.—The Military Review at Longchamp. Our Generals. Rejoining of Artillery Men. Competitive Target Practice. The Education and Instruction of English Officers.

American Monthly Review of Reviews.—July. Peace in South Africa, the King and the British Outlook. West Point and its Centenary.

Internationale Revue.—June. The Railroad of Bagdad and the Gulf of Persia. Observations of Captain Dunn Regarding the Manufacture of War Material in the United States and Europe. Manufacture of Cannon. July.—The French Army of To-day. The Fall Manœuvres of the French Army, 1902. Increase in the Number of Sub-Marine Boats. The Fortifications of Switzerland. The Standard of Horses in the German Artillery. Firing Regulations for the German Field Artillery. New Subsistence Regulations in Time of Peace. New Formation of the Bulgarian Artillery.

Journal of the Royal United Service Institution (London).—June. New Russian First-Class Battleship "Peresviet." What should be the Disposition of the Materiel and Personnel of the British Navy in Time of Peace, and how can Peace Strength be most rapidly Expanded to War Strength. Volunteer Artillery, Past, Present and Future. A German View of British Tactics in the Boer War. Peace Strength of the Russian Army, January 1902.—July. New First-Class Armored Cruiser "Jeanne D'Arc." Garrisons for Coaling Stations. Officers' Shoulder-Belt Plates. Coal economy and the price of speed in Warships. Realistic Targets.

Journal of the United States Artillery (Fort Monroe, Va.)—May and June. The Organization, Care and Service of a 16-Motor Battery. Comments on "Report of Coast Artillery Target Practice, Fort Monroe." A Battery Manning Drill. Extract from the Proceedings of the Board of Officers convened at Fort Wadsworth, N. Y. Artillery Material. Warships and Torpedo Boats. Gunnery. Coast Artillery.

Journal of the U. S. Cavalry Association (Leavenworth, Kas.)—July. Experiences in China. Cavalry Experiences from 1898 to 1901. Transportation of Public Animals by Sea. Fort Washakie, Wyoming. The Automatic Small Arm. The Revolver or Pistol best suited to Cavalry. Molasses as a Food for Army Horses.

La Belgique Militaire.—June 22. Organization of our Cavalry. New Regulations for Field Artillery Practice. Revolution in the Art of War. June 29.—Resignation of the Commander-in-Chief of Cavalry. July 6.—The Chief Command of the Cavalry. Board to report on the Armament of the Artillery. The Widow and Orphans' Penny of Non-Com. Officers. July 13.—A German opinion of the Boer. Reserve Officers. The Conditions for admission of Volunteers. Pension of Non-Commissioned Officers. The Courier and Escort Service. July 20.—The Commission for the better Armament of the Artillery. Flemish Campaigns. A new Krupp Cannon.

Pennsylvania Magazine of History and Biography.—July. Memoirs of Brigadier-General John Lacey of Pennsylvania. Letters of Presidents of the United States and "Ladies of the White House."

Proceedings of the Royal Artillery Institution.—March. Russia and China in 1900. Automobiles from a Military point of view. Historical examples of Sieges from the Franco-German War of 1870-71.

Revue d'Artillerie.—May. A Rustic Rangefinder. The new Italian Field Artillery. Trials of heavy Automobiles in England in 1901. *Italy.* Scheme to reorganize the Artillery. *Russia.* Strength of Heavy Artillery Companies.

Revue de Armée Belge.—March and April Lessons of the South African War. Our Infantry before the Military Commission of 1901. The Artillery in Battle. The necessity and usefulness of a new topographical Map for the Army.

Rivista Di Artiglieria E. Genio.—June. Notes upon the employment of Artillery in entrenchments. Automobiles and their possible employment in War. Advanced positions in Siege Operations. Collection of Studies of officers of Engineers in the Belgian Army

Revue du Cercle Militaire.—June 26. The Camp at Larzac. Organization of the Military Telegraph Service. July 8 — The evolution of Artillery in the 19th Century. Officers of the German Army attached to the Marines. Return of the South African troops to England. Transport of Russian troops to the Far East. The wireless telegraphy on board of Russian battleships. July 12. —The evolution of Artillery in the 19th Century (Continued). The Grand Manœuvres of 1902 July 19.—The Forts of Metz. The General Staff in the 20th Century. Competitive examination for Officer's Commission in the British Service.

Revue Militaire des Armées Etrangères.—June. Sketch of the War in South Africa, 1899-1900 (Continued). The Russian Imperial Manœuvres 1901 (Concluded). The Mobilization and Concentration of German troops in 1870 (Continued). July.—The Mobilization and Concentration of German troops in 1870 (Continued). Sketch of the War in South Africa (1899-1900) (Continued).

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Woman's Home Companion.—July. The Battle of Quahaug Neck. a story of the War of 1812. Woven with the Ship The Death Throes of the Confederacy.

Naval.

Proceedings of the United States Naval Institute.—June. The Defense of our New Naval Stations. The School of the Officer. The Seymour Relief Expedition. Converted Yachts or small Gunboats for training Landsmen. The Results of the Navy Personnel Law of March 3, 1899. McCormick's Navigating Protractor. Opening address delivered by the President of the War College, June 4, 1902.

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2. *Report of the War Department for 1901.* 15 Volumes. Librarian of the War Department.

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JOURNAL
OF
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OF THE
UNITED STATES.

"I cannot help plead to my countrymen, at every opportunity, to cherish all that is manly and noble in the military profession, because Peace is enervating and no man is wise enough to foretell when soldiers may be in demand again."—GENERAL SHERMAN.

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A MORAL PREPARATION OF THE SOLDIER FOR SERVICE AND BATTLE.

BY MAJOR R. L. BULLARD, 28TH U. S. INFANTRY, LATE COL. 3D ALA. VOL. INF., AND COL. 39TH U. S. V.

THERE are two studies which emphasize the need of a prompter and more effective moral training for our soldiers. One is the common lack of manly honor and self-respect shown in too great a percentage of desertion, shirking, and similar offenses indicating disregard alike of the soldier's obligation and of the shame of public punishment. The other is the demoralizing effect of improved fire-arms upon men in battle.

I. FOR ORDINARY SERVICE.

A few years ago the high percentage of desertion and other offenses, showing a low moral tone among enlisted men, aroused the whole army. Vigorous and varied effort was made to discover and remove the causes. Countless boards of survey, inspection reports and essays alleged countless theories and causes: "Utter worthlessness," "Tramp," "Stringent discipline," "Not enough to eat," "Too much extra duty," "Too restrained a life," "Lack of home comforts," etc. These findings led to increased care in enlistments, to canteens, clubs, reading rooms, to improvement in mess, ration and quarters, to less work and more privilege. These measures are undoubtedly good and re-

sulted in a decrease in the offenses. To many officers, however, the results never seemed quite commensurate with the fuss and trouble. To many the measures somehow seemed to be not quite adequate, to be just falling short, to be just missing the thing aimed at—like making close threes and fours instead of bull's eyes. Now recently with almost all of these measures of prevention still in operation, the offenses seem to be on the outbreak again, giving confirmation to the idea that the causes formerly assigned were probably merely contributory, the excuses, not the real causes, and that the remedies applied never really went home to the true seat of the disease.

Dodging, shirking and desertion are the soldier's failure or refusal to respond to moral obligations assumed. They result from inadequate sentiment, manhood, duty, honor, self-respect, patriotism—a moral defect which from its very nature can best and most truly be reached by timely and suitable moral appeal.

Consider our material. The recruit is a young man. Whatever his station, whatever he has been used to in life, in nine cases out of ten he has been moved to enlistment very largely by sentiment, aspiration or ambition for a soldier's career, for military honor. Dreams of glory are in his brain and he is full of fancies about his country and flag, and about doing patriotic, heroic things to win renown and the praise of his fellows. These things may be boyish and absurd, we may laugh at them, but they have controlled him in enlistment and if not ridiculed out of existence, if taken prompt advantage of, they furnish the means of getting control of him for all his service. They are the open way of moral appeal, the means of moral training, of touching manhood, honor, duty, patriotism.

Such and so full of sentiment and enthusiasm is he when he comes. For the average young American, the soldier's life on which he is just entering, with its regular hours, roll calls, constant supervision, inspections, drills, "checks" and "call downs," all of which are necessary and inevitable in soldier-making, will be a mighty change on the civilian's life to which he has been used. Then it is that he is most likely to become demoralized, disgruntled, and to throw off honor and obligations, become a shirk, a dodger or a deserter. His start will

make or mar him. "The young men in especial," says Circular 10, A. G. O., 1902, "many of whom have been but recently taken away from the restraints and influences of home, should be encouraged to look to their superiors, both commissioned and non-commissioned officers, and especially, to the company troop or battery officers, for leadership and support amid the temptations around them." He is undoubtedly just entering on the most observant and impressionable period of his life. Impressions made on him now are made to stay. It is above all the opportune moment to appeal to his sentiments of honor, self-respect, and this, under the circumstances, is best, perhaps, only to be done by talk.

To many officers, who consider that their profession requires them to be men of action and not of words, to talk, especially to the last joined recruit, in any but the briefest possible terms, will no doubt seem quite unmilitary, quite undignified. To such let it be said, that man's nature is not changed with the mere assumption of the uniform and that precept, talk, which with men has always been, with the soldier also remains the indispensable interpreter of moral example and the most powerful means of moral instruction. The use of so great a power over men can never, otherwise than falsely, be regarded as undignified or unmilitary. The future commander ought not, therefore, to hand over the recruit to the sergeant with brief orders to "take him up and set him up." Start him upon his moral course now, and start him not merely by reading orders, regulations and articles of war, for these are only the dead letter of impersonal print; but start him without books by the live word of personal speech addressed straight to the man. It will make him feel that he has come under the eye and interest of a personal authority. Say to him that he has come to serve his country, that it is a high and worthy purpose, an honorable calling; yet that he has made a bad mistake if he is counting only on playing hero with shows, drills, parades, uniforms and perhaps some fighting; that these things are only the little frills; that the sure and steady life on which he can count will be of another kind most largely, to mop the floors, scrub the kitchen, scour pots and pans, clean camp, sweep stables, clean privies and like disagreeable things that men must do in all the business of

life; that these are truly, properly and always military duty, as much as carrying a rifle; that the best have not been exempt from them; that they have got to be done in the soldier's life as in everybody else's life; that the government regards its soldiers as men able to take care of themselves, and is providing no nurse, valet or waiter to take care of them; that to do these things with faithfulness, equanimity and zeal means manhood, straight, without squirming, dodging, whining or playing baby; that he will be ordered, not "asked," and that he has got to take reproof, checks and corrections and be "called down" and "jumped onto"; that there is but one way to do and take all these things —like a man. Ask him and make him answer whether he thinks he can do them, whether he has made up his mind to do them, to take his medicine like a man, or has only come to "try it" and dodge, shirk or desert if he does not like it. Ask him if he has come to soldier or to whine about trifles. That will put him on his mettle. He will see in it a questioning of his manhood which will stir the pride of any young man who even thinks he wishes to be a soldier. He will answer and answer as he ought to, in tones that commit him, that will ring long afterward in his memory, that will call him, many a time in future, to duty and shut his mouth against complaints and excuses. Tell him that the soldier who can do the disagreeable things of daily life, who does his duty best and most faithfully in peace, is he also who serves and fights best in war; that to so much is he bound by manhood, honor and the obligations of his oath; that so much he owes his country and so much will it expect of him. With the average uninstructed young American recruit with his large ideas of equality and ever ready assertion, "This is a free country; I'm as good as anybody," the difference of condition and authority between officers and enlisted men is often long a cause of secret demoralizing dissatisfaction. In the beginning, take the pains to set him right on this point. Show him its logic, its absolute necessity and the fact that it is established and enforced not by officers for the mere gratification of personal pride and arrogance, but by the law of the land, for a purpose. Improve his idea of the dignity of the soldier's life and duty by impressing it upon his mind that subordination is a thing not of persons, but that in obeying his superior he is

serving not that man but the government and the whole country; that if he come up to the full measure of his duty and the obligation of his enlistment oath then is he as much a patriot and a hero, is serving his country as well, as any of those who wore cocked hats and fought for American liberty and independence. Express confidence in him and expectation that he will come up to his duty. Make him understand that self-respect, decent conduct, manly honor, and faithful discharge of duty are expected in the humblest soldier; that if he cannot set himself that standard now and feels that he cannot undertake to come up to it, to say so at once so that his superiors will expect nothing of him. He will not say so; on the contrary he will feel and declare that he can and will, and in nine cases out of ten, owing to the direct personal nature of this talk, he will live up to his promise. He will remember what he said in his pride and promised here when the terms of his formal enlistment oath have long passed from his memory; because, as between him and his commander, it will stand as his personal pledge of honor, failing in which, he knows, means to him the humiliation of a direct acknowledgment of personal shame and dishonor. The poorest men, men with the least spark of pride, dread and shun that shame.

The method is logical, it is human; it reaches men. I have tried it on more than two thousand young soldiers, black and white, of regiments that I have raised and commanded. As recruits came, I received them all. None escaped my appeal. More likely they heard it many times. One regiment was Negroes, not of the superior class of our regulars, but every day Southern Negroes, a few from the fields, more from the mines and wharves, two or three hundred from the vicinity of great convict camps (an easy guess what they had been), some straight from the jails "turned loose" to serve their country, young men almost all of a generation untaught in books, in manners and in morals. Never a regiment had less moral basis to start with. With such men, control by a discipline of force meant convicts, slaves, not soldiers. Moral appeal by plain, earnest talk as I have indicated, became of necessity, the primary, almost the only means. Without delay or hesitation it was freely used. Under it, these untaught, lawless black men

turned into conscientious, zealous, obedient soldiers; under it stood as manly as the best to duty, as faithful as any to the oath; under it held to order, obedience and self control under the severest tests to which Negroes can be subjected, unprovoked fatal assaults, repeated "shootings up" of their camp by night, the bitterest racial taunts, insults and personal abuse in public places by their white comrades; under it even took keen pride and made proud boast of a *morale* that could stand the test of such provocation; and, finally, under its influence after muster out though the bands of discipline were broken, though closely observed to their furthest homes by a hostile public press, by the railroad, state and United States officials, not a case of even the slightest misconduct was found to charge against them.

The method had not failed with Negroes. I repeated it upon a white regiment. From the first and especially at first, every effort was made to touch the pride and put men upon their mettle as gentlemen, to appeal to manhood, honor, self-respect, love of country, love of the flag. This was done in the most direct way as before, by earnest personal talk, but little by writing orders, which, though the usual, I had come to know, is not always the most effectual way of reaching men. Undeniably I aroused in many men too top-lofty ideas of themselves. These, however, soon wore off, leaving a proper self-appreciation and respect, a practical but higher idea of the dignity of their duty and motives. Hurried in organization, rushed on board transports and pressed to contact with the enemy faster than the other regiments raised at the same time, there was no time and little opportunity to establish in the regiment and apply other means of control than moral appeal to the self-respecting manhood and patriotism of the men. To it as being practically the only means used, I must attribute largely whatever of moral result was obtained, as:—

When the regiment was barely collected, a journey half across the continent in perfect order without a case of misconduct—an unusual thing for either recruits or old soldiers who with one accord seize upon such occasions to "celebrate";

Little difficulty always in the management of the men who quite generally showed that they regarded themselves as

specially bound to decency and good conduct by promises made in the beginning to the regimental or battalion commander;

A remarkable absence of dodging, shirking and similar dishonorable conduct, *though one full third of the regiment were men who had been tried over and over for various reasons, worthlessness, misconduct, drunkenness, etc., been thrown out, were in short, the "leavings" from the organization of another regiment;*

Steadfast courage, facing during all their service without squirm or "squeal" hard continuous field work and a fearful death rate in what have proven to be the most insurgent and disease-breeding provinces of the Philippine Islands;

Not a desertion to the enemy—a thing far rarer among regiments than is generally imagined;

Great loyalty to their officers, intense regimental pride; to the last, on and after muster out when all things fail, excellent, self-respecting conduct.

To me the method stands a thing proven.

II. FOR BATTLE.

"Self-preservation is the first law of nature." Avoidance, flight of the danger is so common, so general, so apparently involuntary with both man and beast as to convince us that it is the natural, the instinctive method of self-preservation. In battle the requirements of self-preservation are undoubtedly the facing and destruction of the enemy. The side that flies is lost. On the one hand then is the instinct of flight; on the other the necessity of fight. To eradicate this instinct of flight and put in its place something that will make men fight, that will save destruction and accomplish self-preservation, is the whole object of training.

In more recent times the difficulties of such training have greatly increased. The straining life of highly organized society has undoubtedly made men more nervous, more hysterical and less able to face danger, suffering and death. The growth of peace and civilization with their relief from hardships and the frequent necessity of defense of self and rights, have made them more than ever loth to risk their lives in war and battle. But most of all, in the last third of a century the

prodigious improvements in fire-arms, their scientific, deadly effectiveness, stun and affright the imagination and hold men afar off from danger and the enemy. It has been estimated that since 1870 the general effectiveness of the infantry rifle has been increased from 1 to about 13, and of artillery from 1 to about 40. These figures effect the nerves. Soldiers soon come to know that death is in the missile to its furthest flight of miles; that in the fight any number of living ranks in front of them, trees, houses and walls, are not shelter—there is no help in them; that the spaces and fatigues alone of real battle are in themselves almost beyond human endurance; that the wounded fallen in the crisis must often lie long where they fall under a stream of fire that sweeps back food, surgeon and all relief; that they may perhaps even become a breast-work, a bullet stop as it were, for those still fighting. These are dreadful thoughts, and all combined they have driven the human instinct of self-preservation to a point almost beyond the reach of tactical training alone. Again, when men fought in masses under the eye of the higher leaders, discipline, tactical training, was found adequate to the crisis of battle; but under the enforced individualism of extended order fighting, the leader is often far away, or there is no leader, and the soldier then must become a leader for himself and perhaps for others near him. To win then we must make him feel in himself something more than discipline and tactical training, something that will hold him to the fight, something that will send him on, something of those high qualities, honor, duty, pride, ambition, heroism, patriotism.

In the service when this subject of moral training comes up among officers, it meets with plenty of approval. General Orders No. 125, 1900, and Circular No. 10, 1902, especially call attention to its general need, point out some of the means of obtaining it and earnestly recommend their use. These have not led to sustained or definite effort. It must perhaps be admitted that moral training cannot be reduced to any system, but its value and importance call for more definite attention, for it is higher than discipline. In a crisis it may take and has taken the place of both leader and discipline. Under one influence or another almost all Americans are capable of receiving it; as, by appealing to ambition, pride, etc.; by reassurance upon the chances of

life in battle; and, finally, by appeal to patriotism, honor, duty, etc.

1. *Appealing to the soldier's ambition, love of glory, etc.*—From professionalism or other cause there is a tendency among officers to regard the soldier as an abstract, automatic, impersonal sort of a creature who, being intended for control by the leader, is free, uncomplicated by the motions of his own human individuality. Accordingly they "make," "place" and "handle" him instead of training, guiding and leading him, laying great stress upon mechanical tactical training to form habits of action in the creature, to the neglect of moral appeal to the motives and principles of conduct in the man. As a matter of fact, the soldier is no such impersonal creature; he never becomes such, but remains always a man subject most strongly to the influences that move all men, ambition, pride, love of glory, etc. These are his motives which if roused send many men as far in the fight as it is ever necessary for men to go. Let them be used. Show the soldier that those who fight rule—they do—that the most distinguished and honored have been soldiers. Call his attention to a fact which will go down into his mind, because it is a matter within his own knowledge, under his own eye, namely, that the strong and influential in our country are and always have been largely men who have been soldiers, fighting men who served their country, and that they owe their power and influence to that fact and almost to that alone. Conveniently for us always too, our army furnishes us striking examples, examples that ought to inspire the humblest soldier, of soldiers and generals in the highest ranks who bear first after their names on the army register, "Private," "Corporal," or "Sergeant." Find them. Spread before the soldier the record of their achievement. It speaks and many will heed, many will follow, drawing others still to the furthest stretch of duty and daring. Let the commander impress it upon the minds of his men by repeated word and act that he is ready and anxious to see and know every worthy, brave or heroic act of theirs; that he purposes above all things himself to give to everyone, and to do his utmost to secure for everyone all praise, credit or recognition earned. Let him be prompt to recognize successful effort and careful to recognize and let his soldiers know that he

recognizes effort that is meritorious though unsuccessful. Where he cannot reward merit, let him at least praise it. Where he can give praise, let it be generous, direct and public. Such measures beget among all who observe them the greatest enthusiasm, rivalry and daring. Point out to the American soldier the keen pride which the whole nation takes in his achievements, the praise and honor which it is ever ready and insists on heaping upon him, the anxiety which it displays to see that above all he shall receive his due honor and credit. This is true. The public may slur the achievements of the officer but never those of the enlisted man in war. Convince the soldier that he will sooner or later surely reap the honor of his deeds and gather the fruits of his daring and he will do and dare anything.

2. *By thoroughly engraving on the soldier's mind all facts that show the chances of life still with victory in the fight.*— Of the horrors and carnage, the suffering and long exposure of the wounded to be expected in future battle with improved arms, our soldier soon hears enough and enough that is logical and probable to unsettle a good man's nerve and make his reassurance a matter of importance. Undoubtedly soldiers should know the dangers of battle, but not the dangers alone. All facts, all circumstances that favor his chance for life in battle should be repeated and emphasized until deeply impressed upon his mind. They will add to the confidence, bravery and daring with which he will press the fight. Show him :—

That notwithstanding modern arms, the magazine rifle, the Gatling, automatic guns and pistols, revolving cannon, machine and field guns send missiles "in a perfect hail," "in streams" and "in showers," yet the fact remains and the statistics all prove that the more these improved weapons are used, the fewer men are killed in battle ; the more deadly the arm the fewer its victims :

That notwithstanding the guns of ship, sea-coast, siege, and field belch tons of iron, thousands of missiles so far, so wide, so searchingly that nothing, it would seem, could live under their fire ; yet men do not die in front of them as they did in front of the old smooth-bores. More, far more, are left to tell, and do not fail to tell and exaggerate the tale of hor-

rors. Witness the more recent siege and sea-coast bombardments:

That notwithstanding long zones are "swept," "beaten" and "ploughed" by fire; yet men do live there. Think of the enemy. He too is suffering. If we stick strictly to business, giving him and not ourselves our whole attention, he will have his woes. At the crisis the men who remember this, who can think of this and make yet one more dash, will save honor, the battle and themselves:

That, though trees are shot through, walls are battered and houses knocked down, yet this does not mean death to all that are behind or in them:

Thousands of bullets are shot, but it takes ten thousand to kill one man and the number is ever on the increase:

Many are hit perhaps, yet few are instantly killed. To fall does not mean death. Improved field hospitals, elaborate and complete arrangements for the care of the wounded, wonderful medicines and skilled nurses are provided and are greatly reducing their sufferings and skilled modern surgery is ever reducing the percentage of those who die of wounds:

Though in the crisis it seems terrible to stand, and more terrible to go forward, yet that of which we instinctively think, to go back, is most terrible of all. It is sure destruction:

The bullet's most explosive and fatal effect is at ranges less than 400 yards. To this range, however, it is now rarely necessary to go, or to go only under cover. Before this the battle will have been lost or won, at ranges of from 1000 yards to 400 yards, where wounds are far less deadly.

These are reassuring and encouraging thoughts, and cannot fail to help steady the human nerve and send the soldier further in the fight.

3. *Appealing to Patriotism, Honor, Duty.*—In the crisis of battle, tactical training and discipline, weakened by the enforced extension and individuality of recent fighting, confidence, dash, ambition, enthusiasm—all, must often wilt and fail. Then—honor, duty, patriotism. To bring these into play, there can be no prescription. Thought in training, watchfulness, earnest effort, a conviction of the overwhelming necessity of accomplishing it, will find the means.

Assuredly whatever of moral training may have been given the soldier for ordinary duty, will count also in his higher training for battle. None will be lost. What will hold him to decent conduct and the manly discharge of his peace time obligations will help to bring him also to stand the test of battle. G. O. 125, 1900, and Circular 10, 1902, point out some most effective means of precept as well as of example. Says the latter, "The officers should strive to teach their men self control, to show them that morality and efficiency, in the life of a soldier as in civil life, go hand in hand," and, "Every effort should be made to promote throughout the Army a cleanly and moral tone in word no less than in deed."

I am of those who believe that sentiment still rules men, especially men who come to serve their country in peace or war. Some will jeer this. Let such search their hearts and answer me this, "In enlisting had you no high sentiment, no object beyond livelihood?" I assume the answer and I feel perfectly sure also that recruits in general enter upon the soldier's life with enough of those high sentiments patriotism, honor and duty, if rightly encouraged, to fetch them, if need be, as far as the last sacrifice. They are too much accepted and "handled" on the opposite idea.

In America the people rule. We cannot, therefore, even declare war unless the people desire it. Our soldiers are volunteers from the people. We cannot, therefore, raise an army to begin a war unless the people believe it right and are behind the movement. The feeling that they are right, sense of duty, love of country and of the flag, must therefore be presumed to be in our soldiers if we have any, must indeed be that principally which has made them soldiers or there would be none. For war then, on so much of a basis, belief in the justice of the war, sense of duty and honor to the flag, patriotism, can we surely count to start with in the average American soldier. It remains only to strengthen and encourage these, for so will they give rich account of themselves in the battle, holding the soldier still to the struggle, not letting him fail even at the last sacrifice. In this, it is ever to be remembered that the mind of the recruit just entering service and of the soldier contemplating war with its labors, sufferings and death, is in a specially

impressionable state. Officers may therefore, indeed it is their duty, to wipe out of their minds the foolish fear of appearing undignified or ridiculous which commonly restrains them from talking to the soldier of patriotism, honor and duty. Do not wish in any crisis to get along without sentiment; you will fail. Do not hope to deny or ignore its power over men, do not try to wave it aside with contempt; the methods and arms of to-day more than ever make it valuable.

Some special qualities and fitness are undoubtedly required in the officer who is to undertake this part of moral training. There should be in him some readiness of speech, a knowledge of his subject, earnestness of purpose and a firm conviction of the dignity of the work. If he have this fitness, the future commander of those under instruction, the captain or the colonel, is eminently the proper person to instruct; and, I repeat, let it add to his confidence, the thought, the certainty that however much denied, repressed and hidden away, sentiment in their secret hearts still rules men, even those material things, those chessmen, into which we attempt to drill the regular soldier. Let him talk to his men and let his themes be such as these: The patriotism and the high sentiments and aims of our fathers who founded this government; the labors, sufferings and self-sacrifice in which it was founded and the blood since spilled in its maintainance; the benevolence of its institutions, giving to its own people and to the people of all lands a liberty hitherto unknown among men; the blessings which its existence and continued triumph have brought and will continue to bring to us, to the whole people and the whole world, the justice and fairness towards all men of this government of the people; the consequent duties of honor, gratitude, defense and maintainance even to the last sacrifice of all her sons when she calls. Let him call up the glorious examples of patriotism and heroism from our history—they are abundant; let him talk of the soldier's honor and of the tradition of the American soldier's courage that has not failed; let him dwell upon the confident reliance and expectation, the generous gratitude and great pride of the whole people in their simple soldier, the man behind the gun. There is time to teach all these things. It may cut off some company or battalion close order drills. Are

these so much more essential? Says G. O. 125, 1900, "The absolute and unqualified devotion of those in the military service to the welfare of their country is an indispensable requisite and constitutes the very soul of an efficient army. Hence patriotism will be inculcated and promoted in every possible way," etc.

I have tried these things upon men. They work.

THE USE OF NATIVE TROOPS IN OUR NEW POSSESSIONS.

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WHEN a country acquires new territories, and her boundaries are enlarged, it is but natural that new and important questions arise. One of the most important of these which the acquisition of extensive Island territory has brought to the United States, is the use of Native troops in the government of these new possessions. This question is of pressing need in the Philippines only, for in our other Island possessions it may be considered as settled. But in the Philippines, it now has the serious attention of those concerned in the welfare of the Islands, both in regard to their earlier pacification, and to the future security of peace and order when established.

When we want a man for a certain particular work, we first ask what kind of a man he is. So, in considering this question, we ask: "What manner of people are the inhabitants of the Philippines? What are their characteristics, customs, and manner of thought?"

They are a strange people. Those known to us as the Filipinos are not the original inhabitants of the Islands, but bear the same relation to the aborigines as we, the people of the United States, bear to the American Indians. They are a people of the Malay race, and in remote historical times established themselves in the Philippine Islands. Their language is of the common Malay linguistic family, though differing greatly from the standard Malay speech. In their temperament and features they still betray their origin, and also greatly resemble the Mongolian race. The typical Tagal around Manila could easily pass for Chinese. They are of low stature, averag-

ing little over five feet, slender and cleanly built, muscular, strong and active, of olive yellow complexion, inclining to light brown or cinnamon, somewhat flat features, high cheek bones, black and very slightly oblique eyes, small, but not flat, noses, with wide and dilated nostrils. Mouth wide but not projecting, hands and feet small and delicate, carriage erect, graceful and proud; coarse and abundant straight black hair, scant or no beard. In different sections of the country there is a distinct departure from this description. In Manila, the headquarters of the Spanish, there is a Caucasian type. Then in the north there is a stronger, taller, blacker people, resulting probably from an intermixture with the best of the aboriginal tribes. Sections in the south, also, have their separate types. Originally the Filipinos were "men of the sea," living by fishing, robbing, and piratical excursions; a rough and hard life, which bred a brave and hardy people, impatient of restraint. After they settled on the rich land of the Philippines, this description was still applicable to them, and even now it is, to a certain degree. The Filipino does not think it morally wrong to live by brigandage and robbery.

All Filipinos have a religion; they are faithful adherents of the Church. They may, in regard to their advancement, be divided into two classes—those who live in the cities and towns and have, under the close influence of the Spanish, developed a certain culture, have some education and literature, and have picked up the Spanish system of governing. The second class are those who live in the country, and outlying districts, where the Spanish influence was never strong, and who are only semi-civilized. This part of the population is very greatly in the majority.

All of the Filipinos are of a taciturn, undemonstrative, disposition, as little given to outward manifestation of joy and sorrow as our American Indians, yet extremely courteous toward each other, hospitable, and as a rule, kind to women, children, and domestic animals. Slow and deliberate in speech, neither elated by good nor depressed by bad fortune, normally impassive, indolent and pleasure-loving, they are, nevertheless, capable of the greatest excesses and exertions when their passions are aroused. They are of different tribes, speaking different

languages, many tribes jealous, and deadly enemies of each other. Each principal tribe has school books in their own language and in Spanish, which were arranged by the friars. They are of bright natural intelligence, and readily learn, either as students, or to handle tools and machinery. They always live in the plains near the sea or some river, in houses raised on piles three to six feet above the ground. The houses in each settlement are grouped together; there are no isolated farmers, or separate families, living away from all others. The common food of all, rich and poor, is rice, fish, and fruit. As a people, they are extremely healthful and hardy, although a very large number of young children die, probably due to lack of care, and to the custom of everybody sleeping in one room with all the windows and doors tightly closed. There is, among the people, little sentiment of racial union, although quite a sentiment for the tribe.

Of the aborigines, of which there are probably still several million, I have seen two distinct races. One, the Negritos, or dwarf negroes, a low type of barbarian, rapidly dying out. The other, the numerous and powerful tribes inhabiting the Northern mountains, known to the Filipinos as Igorotes. (A term of contempt, meaning infidels). These tribes are not Christians. They rank through all the grades of savagery and barbarism to the semi-civilized. Nearly all are head-hunters, and some are unmistakably cannibals. All are larger and physically stronger than the Filipinos, and have long, straight black hair. The most Southern tribe of the Igorotes are extremely heavy set and muscular, and as a rule, almost black in color, and while larger and taller than the Filipinos, are more stockily built. They are dirtier than the other tribes of Igorotes. An interior mountain tribe, who call themselves Tinguines, are physically almost perfect, and of a light copper color, like our Indians. Their features are often like the pictures we see of the old Romans, or the Sioux Indian chiefs. The men average six feet in height, and are perfectly proportioned. They are not so numerous as the other tribes, above whom they hold themselves, and with whom they are at war. Most of these tribes are friendly to the Americans, and nearly all have villages, and cultivate the ground. They have bright minds. Their weapons

are spears and battle axes, while some have bows and arrows, and blow guns.

I do not believe that the Filipino character has ever been accurately estimated, nor do I pretend to be able to estimate it. What education they have, their religion, and many customs, they owe to the Spanish race, which, through the Friars and the tribal jealousy of the Filipinos, easily established itself. The people have an inclination towards religion, and readily accepted the Christian faith, and the Fathers did a great deal of good, advancing the people and country on its first step towards progression. And then Spain, finding the country rich, set its heel on their progress, more than three centuries ago.

From the Spanish, the people get their florid speech and agreeable manners, fondness for ceremony, and readiness to strike an attitude. Although the Spaniards taught many things, they were careful not to let the natives learn too much, neither did they change the nature of the people nor all of their customs. Now, we find an odd mixture of old timed civilized customs and barbarity. Usually good humored, careless and easy-going, they can, if they will, be as savage and cruel as any wild beast of the Indian jungle, and if left alone would probably relapse, and again become savages.

It is impossible, from the conduct of one Filipino or of a hundred, to predict what another will do. As a rule they have quick minds, and those who have had the opportunities for education when young are very bright. But as a people they seem immature. That is, in their character they are more like schoolboys than men, and no harder to control than boys. They are silent with strangers, asking no questions and answering none readily; they love to follow their customs in peace, interfering with none, and free from interference themselves. Their power of imitation is wonderful, but they have no originality; that which was taught them a hundred years ago has been handed down from father to son, and is as it was then.

One of their greatest characteristics is their strong sense of justice. Although they are not just themselves, they appreciate justice, and are quick to recognize it in others. They have much *amour propre*, resenting a slight probably more than an

injury. They are presuming, suspicious, and credulous, but generous and hospitable, welcoming the stranger guest and trying to make him feel at home. Centuries of oppression have made them extremely chary of showing their feelings in the presence of white men; they can be as stoical and immovable as the sphynx. They are respectful, quiet, and decorous, and averse to rowdyism. Their word, except among themselves, is not generally to be depended upon, and they have little respect for an oath. They cannot be governed by the Spanish method of oppression and force; are easily guided, but at their least suspicion of a white man show insuperable stubbornness, and grow sullen. Usually they are indolent and pleasure-loving, though when occasion requires it they are capable of great and prolonged exertion. The old piratical strain of the Malay is yet strong within them, and when aroused they are cruel and need restraint. They are a courageous people and of a warlike race. They greatly admire courage in others; only a brave man can win their respect and lead them. They readily attach themselves to the right kind of man, and show him the greatest reverence and gratitude; are then truthful, reliable, and contented to serve.

These are a few characteristics of the native Filipinos as I personally saw them. Remember they are men, who, in certain respects, are like boys. The warrior spirit is dormant within them all; their inclinations are towards a military life. Like our boys, they enter with eagerness into all phases of a soldier's life, rapidly attain excellence in drill, are neat, take on a personal dignity, and take pride in the service. When well led, they rush on with undaunted courage, always in front.

In the Philippines the family ties are always strong; right or wrong, those of kin usually stand together. It is clear, then, that for every Filipino soldier we enlist we gain numerous friends, as his immediate family and relatives,—and they usually are legion,—are interested, and take sides with him. If the Native Scouts had not been used it is possible that the war, in a desultory fashion, would still be going on in Central and Northern Luzon, and other portions of the Islands where there is now peace, with the country even free from ladrones (robbers), which has not been the case for more than an hundred years.

All over the Philippine group those Filipinos who were not insurgents from choice, (and with the probable exception of the Tagal tribe the mass of the people were not), were insurgents through the all pervading influence of the Katipunan Society, (the bloody record of which is unparalleled by any annals of modern times), which instituted a veritable reign of terror. The disobeying of its most trivial order was answered with sure and swift death, not only to the one victim, but usually to his entire family, and often with torture. Even those who were only suspected of being in sympathy, or of being friendly with the Americans, were killed by these assassins ; thousands were murdered.

From this system their organization was perfected, and every man had his allotted place in a company enrolled by order of the Insurgent leaders. The result was that our army had to contend with an enemy which was everywhere,—and nowhere. Look for them and you would see only peaceable citizens or harmless farmers, who take off their hats to you ; or a beggar who asks alms, or a traveling merchant, a musician ; or a woman and children ; or even a small child, who sees you coming and runs in seeming terror, to give notice of your approach, like the good sentinel that he is. All watch you like your shadow, and at the least suspicious movement warn those you are pursuing, long before you can overtake them. The difficulty of offensive operations, under these conditions, are incalculable ; adding ignorance of the language, customs, manner of thought, ways of living, and of the character, they usually amounted to nothing; and it can readily be seen what a herculean task our army had before it.

But when the Army enlisted natives to serve as scouts a new era began. They knew the people, the language, their organizations and leaders, whom to watch, and the country, better than a white man could ever hope to know these things. Through them and their friends information came in, and results were attained. The greater the number of scouts enlisted, the more people broke away from insurgent organizations, until every time the guerillas came out of their mountains into the plains, around the villages and towns, it was at once reported, and they ceased to be able to rob and terrorize an unarmed com-

munity; and, week by week, it became harder for them to live.

It is not so much studying the merits, as it is experiencing the defects of other peoples, which teaches us, and puts us on the path we should follow. For fifteen months, or nearly two-thirds of my stay in the Islands, I had exceptional opportunities for mixing with and observing the natives, as my duties took me among the Filipinos, and into such close communion with them, that probably few Americans ever got so far into their confidence. Being able to speak the native language, in a degree, it was as if one of them had introduced and vouched for me, and things were open to me which were closed to others. Among the Filipinos there are probably no larger proportion of rascals and scoundrels than among any other people. In fact, when classified they are no better or no worse than the people of the United States, unless it is in what we may call finesse. The American is often accused of being brutally frank, and of never concealing his feelings; with the Filipino it is directly opposite; he never shows his feelings, and thereby often ruins himself with lovers of the truth.

Observation and experience lead me to believe that the Filipino will, if properly handled, make a good and loyal soldier in the service.

It is a custom of the Filipinos to select some one as a patron, or leader, and to attach themselves to him, for good or evil. When this happens the patron's word on every occasion is as law, and he can go to the most extreme lengths and resort to the greatest unjustness, before any of his followers leave him. This is most strongly marked when they take on military service. They form a very strong attachment for their leaders, looking on their officer almost with reverence, and his sentiments become in a lesser degree, their sentiments. They will, as I have known, take the most unjust and harsh treatment from their officers, saying: "It was his right," and I believe, not even harboring resentment, when they could have escaped it all by deserting. I have heard officers contend that it was necessary to strike or flog the Native troops to insure discipline, as was the Spanish and Insurgent custom. Such is most emphatically not the case, any more so than it is with our Regular soldiers. My experience was decidedly NOT to that effect.

Nor was it the experience of other officers, I know, who served with natives. Such treatment lessens self-respect and enthusiasm, and may seriously affect the manner in which the soldiers would go about their duties. Teach and encourage them to have self-respect, for it makes a high and enduring spirit, such as the best fighting men have. Abuse, or any system of discipline which murders a soldier's self-respect, will inevitably destroy the best of armies.

In my personal knowledge of, and experience with, four companies of Native Scouts, one of which I commanded for eleven months, I never knew of a desertion, or even of an attempt to desert. The personnel of these companies was about three-fourths Tagalogs and Ilocanos, equally divided, the rest being of different tribes, seven or eight different tribes being represented in all. Some of these men had been in the service of the United States since the winter of 1899, and almost all of them are yet in the service. I trusted in their loyalty, and saw them faithfully perform the most arduous and difficult service, with a cheerfulness and endurance of hardships that cannot be surpassed. From his personal characteristics, the Filipino seems to be especially fitted to be a soldier in his own country, where field service, no matter whether it be in the jungles of mountain or plain, or in the swamps, seems to have special hardships of its own, which we do not have in a temperate climate and which rapidly weakens the average white man. He can drink the water of the country with impunity, which, if unboiled, appears to be poisonous to American soldiers. From previous condition of life he is usually acquainted with poverty, accustomed to plain food in small quantity, and to few comforts. By nature good humored and happy, he can easily stand the exertions and fatigues of a campaign, and thrive on the various conditions and ills which beset the soldier in the tropics.

As the Spaniards enforced their colonial laws with a liberal use of soldiers, and as their colonial officers were usually soldiers, the Filipino looks upon military authority as the very highest of all legal power, even above the law. He has the greatest respect for military authority, and if he can get to be a soldier his happiness is complete. Quick to learn, brave, and amenable to discipline, he has the necessary characteristics of

a soldier; neither is he wanting in the necessary strength, nor pride in the service. When he enlists, he ranks himself above all citizens and civilians. It is at once noticeable in the great improvement in his bearing and conduct, his pride in his uniform, and in the fact that he is now a soldier.

I found that the scouts made good and willing soldiers, both in garrison and in the field, looking on their officers as a child would look on its father. His influence and example are very great, and so great is their trust in him that his men never grumble or complain, even under the most adverse circumstances, sincerely believing that it could not have been helped, as their officers always looked out for them. Their energy and endurance in the field is remarkable. They are unsurpassed in strength and agility by any white race. Under the most arduous labors and fatigue their spirit never wanes. They are never surly, and few shirk duty, but are always good humored and ready for business. I have seen the scouts, in pursuing the guerillas in the mountains of Northern Luzon, continue the pursuit long after the white soldiers had been forced by exhaustion to give up the march. On one occasion an expedition, with scouts and pack ponies, came to a mountain too steep for the loaded ponies to climb, and they had to be unpacked and the loads carried up by hand, and repacked. One trip, such was the steepness of the trail, almost exhausted the Americans, who stopped. Without complaint the scouts continued for more than half a day, without a halt, and finished carrying up the loads; and they were apparently as fresh as ever. One man in particular was noticed to have made eleven trips, surpassing his fellows, and averaging fifty pounds per trip.

When properly led the Filipino makes a splendid fighter, and numbers of them are capable of taking the initiative. I had five non-commissioned officers who were perfectly reliable and trustworthy. Were often sent out alone, and who handled their commands on such occasions as well as any officer in the service could have done. One night twenty-five scouts, under an American non-commissioned officer, were to examine certain villages for insurgents. After searching all but one, which was about a mile farther on, he halted his detail, and sent a native

sergeant and six men to look into that one. The sergeant surprised and captured a foraging party of nine insurgents, bundled up their arms and sent them back by a guard of three of his men, while he, with the remaining three men, went on a short distance farther to try to capture an insurgent major, before he could be warned. Following him farther and farther, at last about 2.30 A. M., they walked into an outpost of twelve insurgents, who opened fire on them. They returned the fire, and the sergeant, by vigorous calling of orders and moving his three men about, and advancing, at last drove an armed force of some sixty of the enemy, (who had fired some twenty volleys), from the field, leaving three killed and one captured, and one rifle and ammunition in the hands of the sergeant; and this all before the main body of his comrades came up.

Another night twelve Native Scouts, led by an American officer, crawled past the guard into an insurgent camp and attacked them, killing twenty-five, capturing twenty-seven equipped ponies and thirty-eight rifles, with ammunition, without loss to themselves.

Another native sergeant, with sixteen scouts, was sent out, and on his return brought in as prisoners an insurgent colonel and nineteen of his men, whom he had surprised and captured.

Numbers of other instances, on the part of insurgents as well as the Scouts, could be cited to show that the Filipinos are not a race of cowards. They can strike the enemy swiftly and hard, and have no compunction about hurting him; rather, needing restraint.

He understands fully the obligations of a soldier. From his race he has the instincts of, and the inclination to be, a soldier. From his social position and previous habit of life, he is of subordinate disposition, accustomed to yield respect to superiors, and to look on military officers as superior to all. He is very easily taught, and, I believe, will be faithful. Great inducements were offered the scouts to desert us,—with the assassin's knife as an alternative,—but such a thing as a desertion was almost unheard of.

But they must be organized with skill and judgment. Tribes that are hereditary enemies should neither be enlisted

in the same companies or regiments, nor serve in the same immediate territory, where they will come into contact.

For instance, the Tagalogs and Macabebes have blood feuds, and should always be kept separate. All the tribes, with the possible exception of the Macabebes, (whose loyalty is considered unquestionable), should, I believe, be enlisted in mixed companies. In the two companies of Scouts which, at different times, I commanded, from four to seven tribes were always represented, Ilocanos and Tagalogs being in the majority. There was never any friction between them on account of their being of different tribes, but always a slight rivalry as to which could be the neatest and best soldiers. There was a strong tendency to report any Scout who did anything wrong, and invariably it was a Scout of a different tribe who did the reporting; if a non-commissioned officer was permitted to select a detail for any special work, he was always particular to select men of his own tribe. Speaking slightingly of other tribes was not tolerated; it was insisted that all were American soldiers, had but one flag and must be friends, and such was apparently the case.

Their officers, to obtain the best results, should always be of a different race. Although he has few characteristics of the American negro, like the negro, the Filipino does not want his commander to be of his own people; he does not and will not trust them, while his trust and reliance in his American officers amounts almost to worship. Then the higher standard of the Americans in everything is one that they emulate. His strength, strictness, and justness, win their respect and admiration, and they readily serve, giving their love and respect to their officer, one whom they consider their superior.

By a judicious organization and careful selection of men to enlist as Native troops, and of officers to command them, there is no reason why the natives of the Philippines should not make as good and loyal soldiers as are now the native troops of the British, or any other nation's colonies. There are large numbers of young Filipinos, filled with martial spirit, ambitious of being soldiers, and with the greatest respect for military authority. It is of little importance to them with whom they take service; they prefer the American army, because with them

they have better uniforms, arms, and pay, and can make more show. With the right kind of officers they will always be true and loyal.

Too much attention cannot be given to the selection of officers to command the Native troops. The ratio of the success of the organization and to the usefulness of the troops, depends on the tact and ability of the officer to handle natives and to get at their natures, and to develop their peculiar talents, and all white men cannot do this. Then, to get the best results, he must remain on the pedestal, upon which, in their minds, they will place him. He must be commanding, strong, and an expert in the use of weapons, and of such a dignity as to command respect.

If this surplus of young men is not enlisted, there is a possibility of continuous insurrections, or formation of robber bands, as they have nothing to do, and will not condescend to be common laborers. They are easily led and influenced, and have an adventurous spirit. Dissatisfied and ambitious men will always arise and seek a following, and their instincts teach them to take what they can by force.

Enlisted, with their interests and our interests one and the same, it is much easier to bring them to our way of thinking, and it is far the easiest way to assimilate these families and make them good "Americanistas."

They should have good pay and rations, and a special and distinctive uniform, of good material, conspicuously or fancifully trimmed, for garrison wear; something to make a good appearance, neat, well-fitting, and dressy. It will do much towards attracting the more desirable class of natives to enlist, as a showy and fine looking uniform increases the pride and good conduct of the soldier, and has a lasting effect on the native mind. For field service give him another uniform, (working clothes for work), of a color that will help screen him in the brush or broken country. In his home life the natives, even the richer classes, are barefooted a great deal of the time, sometimes wearing a list slipper—hardly ever a shoe. My experience, from observation, is that they can go farther and last longer when barefooted. When on an especially hard trip my Scouts always took off their shoes. I do not think the Native

troops should be given the regular issue shoe, but rather, a light, dressy, mocassin-like shoe or sandal, that would not ruin their feet while in garrison, and could easily be slipped off when on the march, in the mud, and on when on a mountainous or rocky trail.

I know that the natives of the Philippines make good soldiers, and if properly handled they will be loyal, and of inestimable value to the Government in these Islands, and believe that no expense should be spared to properly organize and equip them.

TRAINING THE NATIONAL GUARD OFFICER FOR NATIONAL DEFENSE.

By Captain GEORGE D. SNYDER, Late 12th Infantry, N. G. P.

A SYSTEM of education such as outlined by Captain Palmer in his paper* "A National Correspondence School for the National Guard" would be welcomed by many officers of the National Guard.

Nearly all nations that make adequate preparations for war in time of peace, have adopted the economical principle of keeping constantly under arms only a portion of the officers and men that will be required in time of war, but they utilize to the utmost the educational facility of the peace army by having it provide the training and instruction for the officers and men who will be used to augment their forces in time of war.

This principle forms part of the military system of the United States, but the nation has so far failed to define the duties that will be required of its supplementary soldiers or to make adequate provision for their education or training.

The most comprehensive plan we have ever had for the education of the officers of the Regular army has recently been adopted.

The general education and training of the Military Academy is supplemented by special courses in the officer's corps of the service, by courses at the General Service and Staff College and at the War College, the officer going from one to the other in logical sequence with intervals of actual service with the troops of his arm. Such a complete system of education would not be necessary for the officers of our auxiliary forces, but the existing educational agencies and those that it may be necessary to create should form part of a comprehensive and connected plan, bearing in mind that we should rely on the regular establish-

* See Journal M. S. I., May, 1902, p. 395.

ment to furnish and educate the generals and principal staff officers, but that we cannot have too many men throughout the country competent to be subalterns, company and battalion commanders, and officers in the lower grades of the staff departments.

The training of the militia is one of the rights especially reserved to the States by the Constitution, but this reservation is evidently intended to apply to the training of organized units of the militia, and would not prohibit individual officers of organized militia from taking advantage of a system of education provided by the general government, especially if the taking of such a course of study were made optional and if its benefits were extended to others with military training and inclination and not confined to those in the State service.

The existing agencies for the education of a reserve of officers for possible use in time of war, are the Regular army, the National Guard and the colleges where military instruction is given by officers of the Regular army. A correspondence school similar to that suggested by Captain Palmer might form a useful link to coördinate the work of these agencies, put the finishing touch to their product and fix a standard of efficiency for eligibility to appointment as an officer of volunteers.

Every year large numbers of men complete their term of enlistment in the Regular army many of whom with a little additional instruction would make good officers of volunteers. Very few of these men enter the National Guard, and they soon lose touch with military life and are absorbed in the civil life of the people. Their value to the country as soldiers is practically limited to the time they actually serve, when it might be extended to old age by a system of instruction which would enable them to make good the deficiencies in their education, keep them in touch with the changes in Army Regulations and drill, and make them available for use at short notice in time of need.

No one realizes the deficiencies in the education of the officers of the National Guard better than they do themselves. Not a few of them are naturally studious and for such, a correspondence school would be valuable in systemizing and directing their studies, but with many it would take a strong

inducement for them to take up a course of study that would make large inroads on their spare time in addition to those made by their duties as officers of the National Guard.

The government in its attitude towards educational institutions where military instruction is given by officers of the Regular army, has apparently followed the precept of casting its bread upon the waters in the hope that after many days it would return unto it. For the government, after aiding in the giving of a military education to a large number of young men, makes no provision to avail itself of their services in time of need, or to provide for their further military education, or the means by which they could keep in touch with the constant change and development in military affairs.

In comparison with the large number of graduates of these schools few enter the National Guard or obtain commissions in the Regular army or volunteers. Complete statistics for the whole country on this point are not available, but as an indication of the proportion of officers in the National Guard with training in such schools, the writer has ascertained from the Annual Report of the Adjutant General of Pennsylvania, that after deducting chaplains and medical officers, out of a total of 794 officers of the National Guard of Pennsylvania only 70 or not quite 9 per cent. are on record as having attended a military institution of any kind. As the great majority of officers of volunteers in the War with Spain were taken from the National Guard, and if Pennsylvania can be taken as representative of the country, we should be safe in saying that less than ten per cent. of the officers of volunteers in the recent war had received military instruction in educational institutions of any kind.

In view of this fact it would seem that more immediate and practical benefits would have been derived if the same number of officers detailed to educational institutions had devoted their time to a system of education by correspondence for the National Guard such as outlined by Capt. Palmer, particularly if in connection with such a system, instruction and lectures were given by such officers at central points throughout the States, on the principle of university extension so successfully adopted by some of our universities.

The principle followed in the organization of the volunteer

regiments for the recent service in the Philippines of appointing the regimental commanders and most of the other field officers from the Regular army has been generally commended, and will likely be followed in the future excepting in those National Guard organizations that volunteer as a body. But if this principle were followed in the organization of an army ten times the size of the normal peace strength of the Regular army, which was the rate of increase in the Spanish war, it would leave the regular organizations practically without company officers, at the very time when they most need a full complement of officers. By a system of education in which the Regular army, the National Guard, the military colleges and a national correspondence school were all working together, it is believed that a much more competent reserve of officers could be trained, not only for volunteer regiments, but fit to be used in the subordinate grades to give a full quoto of officers to the regular organizations in time of war.

As stated before, to induce most men, who have a living to make, to study, some valuable reward must be offered, and it is doubtful if a certificate or diploma of eligibility to appointment as an officer of volunteers would be sufficient, unless the holders of such certificates were given by law the preference over applicants without such qualification.

What a National Guard officer values the most is his commission, and yet his hold on his commission in most states is most precarious. If his position is elective he may fail of reelection through no fault of his own, if it is appointive he may lose it through a change in the appointive power, or a change in residence, or interference of his business may compel him to resign, and the services of a more or less competent officer, on whose military education more or less has been expended, are prematurely lost.

It would seem that the granting of a commission by the National Government as an officer of the reserves or volunteers based on the passing of an examination after a prescribed course of study, and the applicant's physical condition and military experience, would be the strongest inducement to study. Such a commission would be much more highly valued than one from a state, as it could be held during good behavior un-

til the holder became too old for the activities of military life.

On the principle that nothing should be left until the commencement of a war that can be as well or better done in time of peace, it would seem that the selection as well as the training and education of our auxiliary officers should be made before hostilities commence, as the administration could then devote its energies to the prosecution of the war, instead of devoting so much time to the claims of civil candidates for commissions, and applicants could be told that study and training in time of peace were better qualifications for commissions in time of war than the endorsements of the leaders of the dominant political party.

As a further inducement to study and efficiency, those who distinguish themselves at military schools, in the National Guard or the correspondence school should be admitted to the Army Service schools and detailed for short periods for service with the Regular troops and at such times should receive the pay and allowances of their work.

The point mentioned by Captain Palmer, that in addition to the valuable information the student would receive, the instructors would become well informed as to the capacity and limitations of the *personnel* of the officers of the National Guard, is a good one and with this information the War Department should be able to make judicious selections for special duty in the future.

In conclusion, the writer would state that he considers Captain Palmer's suggestion to be a very good one, but that it should form part of a comprehensive and connected scheme for the education of a reserve of officers, in which all who have fallen under the educational influences of the Regular army, the National Guard, and the military colleges, as well as those with actual experience in our recent wars, should be given an opportunity for further study and development and that those that prove their ability should be suitably rewarded and encouraged.

THE MEXICAN MILITARY ACADEMY.

By Colonel HUGH T. REED.*

THE Military Academy of Mexico was established in 1822 at Chapultepec by Emperor Iturbide and with the exception of a few short intervals since then, the government, whether an empire or a republic, has maintained it. Emperor Iturbide, Sante Ana and Maximillian and Presidents Juarez, Lerdo, Diaz and Gonzalez all put their impress upon it, and although their ideas differed they all recognized the necessity of maintaining a training school for the education of young men to become officers of the Regular army, and each ruler did what he could for the success of this academy, which has been upon a firm foundation since the second election of President Diaz in 1884.

In the various changes of Mexico from a republic to an empire and from an empire to a republic, the military academy has had several different homes; the first at Chapultepec, then in Mexico city, then in Tacubaya, a suburb of the city, and then at Chapultepec again, where it has been since 1883.

Chapultepec or Grasshopper Hill, the cradle of western civilization, the home of the Aztec Montezuma kings, then of the viceroys of Spain, and afterwards of Mexico's emperors and presidents, is an ideal place for the country's military academy. This hill has a flat top, just large enough for the Mexican White House and the school. It is one hundred and fifty feet above and overlooks the capital city two miles distant, with which it is connected by an electric car line and also by a handsome boulevard called the Paseo de la Reforma that is lined with grand old trees and scores of statues of Mexico's great men. In the centre of the paseo and at suitable intervals apart are the statues of Cuauhtemoc, the last of the Aztec kings, of Columbus the discoverer of America, and of Charles IV the king of Spain

* Author of Cadet Life at West Point, etc.

CHAPULTEPEC—MEXICAN WHITE HOUSE AND MILITARY ACADEMY.

when Mexico declared her independence. There is a fine large spring on this hill and the building now occupied by President Diaz as his residence was begun by the Montezuma kings and improved upon by its various tenants since then, until it is now a palatial home where birds sing in the trees among flowers always in bloom. This hill not only overlooks Mexico city, but also the great valley in which it and seven lakes are situated, and from here one may gaze with awe upon the nearby mountain peaks, some of which, although in the torrid zone, are so high that they are always capped with snow, and one peak, Popocatepetl, the tallest mountain on this continent, towers to the immense height of seventeen thousand, seven hundred and eighty-two feet or over three miles above the sea. Chapultepec itself has an altitude of seven thousand five hundred feet, which gives it a delightful climate all the year around, and, as Bayard Taylor says, it possesses one of the three grandest views in all the world. Nature has certainly been very kind to the young men fortunate enough to attend this academy.

Chapultepec has been the battle ground between Aztecs and Spaniards, Spaniards and Mexicans, factions of Mexicans themselves and Mexicans and Americans, and at its foot—the head of the paseo—there is a monument erected to the memory of the six cadets who lost their lives in the heroic effort to prevent Chapultepec, their student home, from falling into the hands of General Scott. A few days before their own surrender the cadets witnessed from their parade ground the battle of Molino del Rey upon the plain a half mile distant, and not long after this they saw the smoke and heard the cannonading of Churubusco, the last battle of the war between Mexico and the United States, in 1846–48. Hence, there is no other place in Mexico more beautiful, nor is there one better calculated to inspire patriotism than the Mexican Military Academy.

The son of any Mexican, native or naturalized, over fifteen and under twenty years of age—except sons of army officers, who may enter a year younger—of good moral character is eligible for appointment, provided that the accommodations at the academy are sufficient for all who pass the preliminary examinations. Additional buildings, all of stone, have recently been erected here, so that there are now two hundred and

CHAPULTEPEC—MEXICAN WHITE HOUSE AND MILITARY ACADEMY.

eighty cadets in this school. Sons of citizens of foreign countries are sometimes admitted.

Appointments are made by the Secretary of War and Navy, to whom all applications must be made in writing by the candidates themselves in October or November of any year. Each application must be accompanied by the written consent of the parent or guardian, authorizing the applicant, if accepted, to sign articles binding himself to serve in the Regular army for four or seven years after graduation as the Secretary of War and Navy may elect, and the application must also be accompanied by a bond to indemnify the government at the rate of sixteen dollars per month in case of failure of the applicant to graduate through any fault or neglect of his own.

To obtain admission the candidate must pass a rigid physical examination and a satisfactory mental examination in spelling, reading, arithmetic, geography and history, and in the two last subjects he must be particularly well versed in all that relates to his own country. All examinations are held at Chapultepec and diplomas from any private institution of learning give the candidates having them no advantage over those not having them, but a diploma or a certificate from certain public institutions setting forth the subjects required that the applicant is proficient in, exempts him from examination in them.

The preliminary examinations are held annually between the first Sunday in December and the 8th of January. About forty per cent. of the candidates fail to graduate.

The course of study, which includes English for the first three years, is the same for all cadets, and at the end of this time certain of them are graduated into the infantry, cavalry and artillery as first or second lieutenants according to class standing, while those designated for the engineers and the general staff pursue higher branches of study, and they are graduated as second captains four years later, thus making theirs a seven years' course. In addition to commissions in the army, medals of gold and silver and certificates of honorable mention are awarded by the government to all who attain certain degrees of proficiency in both mental and practical attainments.

The academic year begins on the 8th of January and closes on the 25th of October, when the field work begins, and con-

POPOCATEPETL—NEAR THE CITY OF MEXICO.
17,782 feet above the sea.

tinues until the 4th of December, on which date the cadets return to their barracks for the graduating exercises that take place on the following Sunday. The graduates are then assigned to their new stations and the undergraduates go into camp the next day.

There are two vacations each year, the one during Holy Week that ends with Easter Sunday and the other from commencement Sunday in December to the 8th of January, but in addition to these two general vacations any cadet whose deportment is satisfactory may obtain leave to visit Mexico city from 7 P. M. any Saturday to 7 A. M. the following Monday.

The daily roll-calls during the academic year are substantially as follows, viz.:

5:30 A. M., *Diana* or Reveille.
6:00 " Inspection of Quarters.
6:15 " Breakfast.
7:00 " Gymnastics, Fencing, Drill.
9:00 " Recitations and Study, Sick Call.
12:00 M., Dinner.
1:00 P. M., Recitations and Study.
6:00 " Recall.
6:30 " *Retirada* or Retreat.
7:00 " Supper.
8:00 " Study.
9:00 " *Toca silencia* or Taps.

At taps lights are extinguished in the dormitories, but any cadet wishing to do so may go to a study room and there under the eye of a cadet officer of the guard he may study as late as he pleases. As examinations approach this room is well filled until long after midnight by studious cadets and by those afraid of failing.

The gymnasium is well supplied with modern apparatus and appliances for the physical development of the cadets, and there is a large room filled with models of mechanical and engineering devices of every kind that are used in simplifying the descriptions in the text.

The cadets are organized into a battalion of two companies and a band of from twelve to fifteen pieces. They all wear dark blue uniforms and the battalion is armed with Mauser rifles for infantry and Mauser carbines for cavalry drill.

The buildings—all of stone—are two stories high and they are placed close together on account of the limited level space. The quarters for the officers and professors are consequently contracted. The recitation, armory and model rooms are well arranged and each company has a long room for its sleeping apartment. The beds, one iron bunk for each cadet, are arranged half on either side of the room with the heads against the wall as in the ward room of a large hospital. Each cadet has a small wardrobe, a case of shelves and a chair. The lavatories and water closets are in other rooms. Each company has an armory of its own and the Molino del Rey or "mill of the king" is used as a powder magazine. Each cadet is required to make his own bed and to clean around it, but a janitor scrubs the floors, washes windows, etc. The dining room is a long and narrow one. The cadets at meals sit upon benches without backs and eat from plain delf ware on tables with cloths, but there are no napkins. Meals are cooked and served by servants called mozos.

Wednesdays and Fridays of the academic year are drill days, the Fridays of June being devoted to target practice, and on the other week days practice is had in fencing and gymnastic exercises. The drills during the first year are in infantry, during the second in cavalry, during the third in artillery, and during the forty days in the field all cadets perform the duties of sub-lieutenants of the arm of service they are assigned to in the brigade of regulars to which they are attached. They are taught how both a mule and a wagon are packed for a march, and they are also given instruction in embarking on and disembarking from a railway train. In the field the seven year cadets are given instruction in making trenches and other fortifications, building bridges, etc. and upon the completion of a work, a sham battle is fought to illustrate the methods of attack and defense.

In addition to this, three or four times during the academic year each cadet is sent for a week at a time to Llanes de Urus, a nearby fort garrisoned by a mixed brigade of troops, where he is also given practical instruction as a commissioned officer.

The cadets are not well set up, and they do not present a soldierly appearance either singly or in ranks, but they seem

quite studious and they are very polite to one another and to visitors they meet.

The cadets march to and from meals and recitations, all formations for roll-call being upon the parade or parade ground.

In barracks, guard duty is performed by the cadets and each relief walks post for two hours, rests or sleeps for four hours, and then for two hours sits upon a bench with rifle in hand, ready for any emergency that may arise. There are three reliefs and the guard is changed daily.

Every Thursday, from half past five to seven the regimental bands from the city take turns in discoursing music on the parade ground for the entertainment of the cadets and for visitors who have obtained permits to enter the academic grounds. At this time the cadets may dance with one another.

New cadets undergo a certain amount of hazing before they are admitted on terms of equality with those who precede them.

Foot-ball is unknown at Chapultepec, but base-ball is a popular sport, and in lieu of a graduating hop the cadets give a theatrical entertainment in the study room.

The government furnishes board, clothes, etc., but it does not pay the cadets a salary, hence expenses for any purpose other than necessities must be borne by the cadets themselves.

For many years past the President of the United States of Mexico has imposed upon himself the task of handing to the graduates their diplomas, medals and certificates on commencement day, and on this festive occasion he stands upon a platform on the parade that is bedecked with flowers from his own garden and his favorite military band discourses sweet music at proper intervals during this interesting ceremony.

Colonel Joaquin Beltran is the present Director, and he and most of the officers and professors now on duty at the Mexican Military Academy are graduates from it.

French

††† ARTILL

ATTLE OF ECKMÜHL.

THE CAMPAIGN OF ECKMÜHL, 1809.—

NAPOLEON'S MOST BRILLIANT MANŒUVRES.

By FREDERIC LOUIS HUIDEKOPER.

III.

[*Concluded from September Number.*]

THE night of Thursday, April 20th, was a busy one in the Imperial Headquarters, for the indefatigable Napoleon was resolved to follow up the advantage gained to put the Austrian left wing decisively *hors de combat*, seize the Austrian communications and then to roll the Archduke up in the *cul-de-sac* between the Isar and the Danube and annihilate him.[1] He accordingly ordered Berthier to write to Masséna:—

"We have beaten the enemy for two days and made lots of prisoners, taken guns and flags. His Majesty supposes that you are on Landshut. *It is very important to have a bridge over the Isar; that will be of great use in gaining on the enemy and reach his line of operations.* The Emperor thinks that nothing can resist your army; you can therefore go head down. ALEXANDER."[2]

Wrede was ordered to move early on Landshut "and upon reaching Sachsenhausen to assure himself whether the enemy still holds before Rottenburg; in this case to fall upon his rear." Vandamme was directed to follow Wrede and Nansouty to move through Rohr. At 5 A. M. Napoleon wrote to Davout at Teugen:—

"Day before yesterday and yesterday are another Jena. The Duke of Rivoli ought to have arrived yesterday at Landshut, since 3 P. M. yesterday. You have before you only a curtain of three infantry regiments.[3] I have had the villages of Thann occupied; a lot of wounded were found there.

This morning I am ordering the Duke of Danzig with Demont's

[1] Compare Hamley, p. 144. "It is not enough to pierce and divide the enemy's army; the advantage thus gained must be promptly followed up, or a subsequent reunion of the parts may nullify all the previous operations. * * * That is to say, the first stroke must be followed up by successive blows on one or both sides, which shall, at once keep the enemy asunder, and destroy his force."

[2] Pelet, tome 2, p 411. The italics are ours.

[3] Napoleon had evidently forgotten the immense force behind this curtain.

French division and Deroy's Bavarian and the Saint-Germain's cuirassiers to move on Langquaid, to put to rout this rear-guard which covers their parks and their wounded, and to pick up everything during the day. If you hear the guns, it will be that; in case of need you ought to support him.

Boudet's division slept at Neustadt.[4] I am ordering it to proceed to Abensberg. This fine division is under your orders.

Here is what you have to do. The Duke of Danzig is going to pursue the parks, the equipages and even Prince Charles, if he takes the direction of the Isar and if he should go to Landshut by Eckmühl, or should go to Straubing, support him if he needs it.

Whenever your rear is cleared, when you will have gathered up lost men (and) baggage, you will move on Ratisbon; you will attack Bellegarde and Klenau; you will act in such a way that the left bank of the Danube may be cleared and that only the remains may rejoin.

I am proceeding to Landshut, and, as soon as I shall have done all the harm possible to the enemy, I shall anticipate him on the Inn. I await during the day frequent news from you. I shall be on the road from Rohr to Landshut."[5]

At the same hour Berthier wrote to Lefébvre of the movement of Napoleon on Landshut and directed him that:

"He ought to leave at Rottenburg the Prince Royal's division, which there forms a sort of reserve,[6] and to march in the direction of Langquaid with the divisions of Demont, Deroy, Saint-Germain's brigade and the Bavarian cavalry. He will march at the head of Demont's division, will push the enemy with all the French impetuosity, will seize the parks, the baggage, will have the Bavarian cavalry attack, supported by the cuirassiers of St.-Germain. He will send news about the positions and the movements of Prince Charles toward Ratisbon, Straubing, and Landshut. If this one is already engaged on the road to Landshut and anticipated this side of Eckmühl, he is going to be cut off on the Isar," and Lefébvre was ordered to concert with Davout.[7]

The reserve was formed by Oudinot's two divisions, (Tharreau and Boudet) which had moved on the 20th from Pfaffenhofen to Neustadt and were ordered "to march on Abensberg and on the road to Ratisbon, to take orders from Marshal Davout in case he has need to be supported, and to hasten their steps if they hear the guns."

Napoleon's masterful dispositions were thus manifested. The line of operations through Neustadt and Vohburg to Donauwörth could scarcely be compromised until the advance on Landshut had been ended because Davout would be additionally supported by the veteran French divisions, reinforcements had

[4] Of Masséna's corps, directed from Pfaffenhofen under Oudinot.

[5] Napoleon Corresp., 15, 100, vol. 18, pp. 491-492.

[6] To cover the line of operations, preserve the communication with Davout, and to observe and contain the left of the Archduke.

[7] Pelet, tome 2, pp. 37-38.

been directed on all the essential points and the intercommunications had been perfectly assured. Even if Davout were repulsed beyond the Grosse Laber the French would have to traverse a shorter distance than the Archduke who would thereby be deprived of Kollowrath's aid and additionally be assailed by Masséna. If Davout *in extremis* were driven across the Danube or the Lech on Ingolstadt or Donauwörth, Napoleon could easily change his own line of operations and take that of Masséna from Landshut through Freising on Augsburg and Ulm. Indeed the more one studies the dispositions for these five days the more one becomes astonished at the marvellous foresight and profound care with which Napoleon had prepared for every eventuality.[8]

During the night the Archduke Louis, Hiller and Kienmayer continued to fall back on Landshut by the roads from Rottenburg and Pfeffenhausen in great demoralization, their retreat hampered by the artillery parks and baggage trains choking both roads. As the Isar was approached the disorder increased since the plain on the left bank was full of canals and marshes and the two roads leading to Landshut, there forming long narrow causeways like dykes, were literally blocked by artillery, baggage and pontoon wagons, and conveyances of every conceivable sort. The three Austrian corps experienced the utmost difficulty to penetrate into this inextricable jungle of wagons and their hardships were increased when the French appeared advancing with the precision of parade on the heights. Hiller ordered Vincent (3d division) to form up his cavalry to resist the French onslaught and supported him by 4 battalions of Kienmayer's Reserves. Napoleon brought up all the artillery to play upon the disorganized troops struggling along the dykes and under cover of this overwhelming fire launched the cuirassiers (Nansouty), all the Allied cavalry, (now under the command of Marshal Bessières, Duke of Istria) and Lannes' grenadiers (Morand's division) against Vincent, who was thrown back upon

[8] "A great captain ought to say to himself several times a day, 'If the enemy's army should appear on my front, on my right, on my left, what should I do?' If he finds himself embarrassed, he is badly posted, he is not correct. He ought to remedy it." Napoleon, Observations sur les campagnes de 1796 et 1797. 5th observation. Corresp. vol. 29, pp. 338 339.

the disordered rabble on the *chaussées.*[9] Guns, wagons, and pontoons were abandoned and the disheartened Austrians fled in hopeless confusion into Landshut, where they attempted to burn the bridge across the river, but General Mouton, one of Napoleon's *aides-de-camp*, with the grenadiers of the 17th followed close on their heels and prevented its destruction. Behind Mouton came Wrede and Morand and another desperate fight ensued in the suburbs where the Archduke Louis and Hiller fearlessly exposed themselves in order to make a stand to reform their troops and save part of their artillery.

Meanwhile on the south Masséna had sent his light cavalry from Freising to Moosburg where it surprised the Austrian detachment and occupied the triple bridge. Marulaz' cavalry supported by Claparède's division was pushed on to Landshut by the eastern bank driving Nordmann—(4 squadrons and 1 battalion), whom Hiller had sent on Moosburg—on Landshut, but Claparède, declining to act without orders from Masséna, did not support Marulaz and a capital chance of cutting off the Austrian retreat was lost. Masséna, informed of this action, hastened up by the right bank and reaching Landshut before noon joined in the general attack,[10] and the Austrians, thus menaced, at once abandoned Landshut and pursued by Bessiéres' cavalry to Geisenhausen retreated through Neumarkt across the Inn to Neu-Ötting, completely isolated from their centre and right.

The battle of Landshut completed the dispersion and demoralization of the Austrian left wing which had lost heavily [11] and was definitely put *hors de combat* during the rest of the campaign of Eckmühl. The arrival of Masséna's corps swelled the total of the troops at Napoleon's disposition to 105,000 and left him free to concentrate, this time on his left, in order to crush the Archduke Charles who had that day lost his part of his park, baggage, pontoons, depots, hospitals and *his real base.*

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[9] At 7.30 A. M. Saint-Sulpice was sent with a Bavarian brigade and cavalry to drive the enemy out of Essenbach and to send patrols to Ergoldsbach for news. Napoleon, Corresp. 15, 103, vol. 18, p. 493.

[10] Masséna's report

[11] Eleven officers and 639 men were killed; 29 officers and 2119 men wounded; 21 officers, 2313 men, 38 guns. 500 wagons and one pontoon train were captured by the French. Osterreichs Kriege seit, 1495, p. 106.

In contrast with the precise, rapid, and decisive movements of Napoleon those of the Archduke were timid, slow, and unproductive of results. Lichtenstein was ordered to send Veczay on Abbach, supported Lindenau between Volchering and Hinkopen, and by the grenadiers at Egglofsheim; Rosenberg was to move behind Dinzling to cover the road to Eckmühl and communicate with Veczay. Hohenzollern was to halt behind Unter-Laichling, with his advance-guard between Leierndorf and Paring and a detachment across the Laber awaiting Hiller; Kollowrath on the march to Hemau was ordered back to Ratisbon,[12] while Bellegarde turned to Hemau to observe the road to Kelheim, and the Archduke, thinking that Napoleon was before him, awaited developments. In this erroneous supposition he was shortly confirmed, for just before 8 A. M. Davout advanced from Hausen and Teugen and vigorously attacking Hohenzollern's posts drove them in and forced that general, who had as then received no orders from the Archduke, to retreat across the Grosse Laber to Schierling. Rosenberg—who had likewise received no order—hastened to evacuate Dinzling and move to Unter-Laichling, between which and Schierling he took position after considerable fighting. About 8 o'clock Davout learned that Lefébvre, with Deroy, the Prince Royal and Demont, was moving on Langquaid to support him, had driven Rosenberg's rear-guard across the marshes, and in spite of being taken in the flank by an Austrian battery, had attacked and captured Schierling. The Archduke, more apprehensive than ever, ordered Hohenzollern to hasten to Rosenberg's support by crossing the Laber at Eckmühl, breaking the bridges, and taking position between the road and Laichling, and Lichtenstein to leave his advance-guard on Abbach and to threaten, through Volkering and Weillohe or Luckenpoint, the French left. The grenadiers were posted between Hoheberg and Mos kof, facing Luckenpoint, where the Archduke feared to be turned.

Opposite these troops and separated by the deep valley of Laichling, Montbrun was posted on the extreme left toward Dinzling; on his right Saint-Hilaire, Friant, and Demont, the cavalry and the Bavarians took position at 11 A. M. and at 11.30 the guns came into action. Davout advanced Friant in *echelons*

[12] This order was not received until 6 P. M.

to outflank the Austrian left and about noon carried Santing. The Archduke hastened thither to prevent the breaking of his line between Rosenberg and the Reserve and sent urgent orders to hurry Lichenstein's regiments to that point; he also directed one of Hohenzollern's brigades on Egglofsheim and posted another behind Rosenberg. The Austrians then took the offensive and stormed the heights, but Davout drove them back into the valley with great loss and retaliated by attacking their centre and left near Unter-Laichling in spite of the constant fire of an overwhelming mass of Austrian artillery. At 6 P. M. the Archduke relinquished his attacks, after having lost in killed and wounded 67 officers and 2872 men,[13] and occupied the plateau east of Schierling and Eckmühl (Rosenberg and Lichtenstein) Egglofsheim (Hdqrs. and Hohenzollern), Gebelkofen (Lindenau) Traubling and Köfering and Abbach (Veczay),[14] thus forming a semi-circle from the Danube to the Laber in the middle of which the French occupied the position Santing-Schierling with the Prince Royal in reserve at Rottenburg.

It may be true that the broken ground covered with woods prevented the Archduke from ascertaining the force in his front, but no praise is too high for the skill and prudence with which Davout made the best of his greatly inferior force[15] and by the vigor of his attacks caused the Archduke to fear lest the Austrians should be cut off from the Danube. Although Davout lost as heavily as the Archduke[16] his audacity was such that early in the day he caused his bivouac fires to be lighted to show the enemy that he did not intend to give way one foot of the ground already gained.

One of the most important and skillful achievements that day was the change in the French line of operations. The concentric movement from Rohr on Landshut had, to be sure, made Napoleon master of the Archduke's lines,[17] yet his own were

[13] Osterreichs Kriege, p. 106.

[14] For a brief but thorough description of the distances *vide ibid.*

[15] Davout had barely 30,000 men, to whom Lefébvre added 24,000 opposed to 9 ,500 Austrians.

[16] The Austrian losses were 11 officers and 415 men killed, 56 officers and 2457 men wounded. Oesterreichs Kriege, seit 1495, p. 106.

[17] "The most advantageous direction of the lines of operations is that which permits an army to threaten the communications of the enemy without compromising its own." Derrecagaix, Strategy, p. 230-231.

not as thoroughly assured as he desired, because the advance of Bellegarde across the Danube threatened them between Neustadt and Donauwörth. *One of the characteristics of his strategy was the singleness of the line of operations*[18] *and he did not abandon his former line but changed it, which is the ablest manœuvre in war.*[19] At 3 A. M. he had caused Berthier to write from Rohr to General Moulin, the Governor of Augsburg, "to assure the army's route through Augsburg and Landshut, by sending Dachau a good corps and a good general, either the battalions of General Marion or the regiments of the Confederation. These troops will, when Jellachich evacuates it, proceed to Munich and will guard the Isar as far as Freising. The Emperor is striking the last blow and everything takes the enemy away from Augsburg. * * * " Indeed the last despatch sent off from Landshut next day when the Emperor was leaving for Echmühl bore upon this important line, and was addressed to General Rouyer, commanding the Confederated troops at Ingolstadt:

"I inform you, General, that all which is between Donauwörth to Vohburg is at your orders. If there are extraordinary wants it is for you to dispose of everything without awaiting orders. If the enemy forced the side of Danauwörth, all which may be on the Danube would regain Ingolstadt or Augsburg if they have not the time to reach Ingolstadt. You must not forget the troops at Neuburg; they will fall back first on Ingolstadt, or finally on Augsburg, if they have not time to rejoin Ingolstadt." * * *[20]

Napoleon waited as usual until after midnight when all the reports had been received, and at 2.30 A. M. wrote to Davout on the heights of Eckmühl:—

"My Cousin,

"General Piré arrives.[21] *I have sent you General Oudinot with*

[18] Napoleon never operated except by a single line. Jomini, Grand Mil. Oper., vol. II. p. 11.

[19] "He does not violate a second principle not less sacred, that of not abandoning his line of operations, but he changes it, which is considered as the ablest manœuvre taught by the art of war."

Napoleon, Précis des guerres de Frederic II. 10th observation. Corresp. vol. 32. p. 184

[20] Napoleon, Corresp. 15, 109, vol. 18, p. 497.

[21] Piré brought Marshal Davout's report:

"To the Emperor and King:

"Heights of Eckmühl, April 21st, 1809, 7 P. M.

"Sire,—I am sending to Your Majesty General Piré, who, having seen everything, will have the honor to report to you on my position.

"My ammunition is all used up, and whatever diligence may be exercised I shall not have my park ready before to-morrow evening."

Davout, Corresp. vol. II, p. 487.

Tharreau's division and Boudet's division. My movement on Landshut and the advance-guard which is already half way to the Inn, ought to decide the retreat of the enemy, who will probably hold to clear away his artillery. If it were not otherwise and the enemy holds all day and you should judge yourself able to hold your position or every other analogous position and that a division of 25,000 men on Eckmühl would furnish favorable positions to that position which is behind the enemy, you can so inform me. I can have your reply before 1 P. M., and I have already ordered General Vandamme, the divisions of Gudin and Friant and the cuirassiers to be at Ergoldsbach before noon with their advance-guard at Neufahrn and on the little river of the Laber. Try to put yourself in communication with these troops by the peasants and by the cross-road.

Finally, if you think your position untenable, you are free to take that which will suit you, *taking care merely to protect the communication which passes through Rohr, Rottenburg and Landshut, so that we can unite ourselves promptly.*[22] I wanted to give this letter to Piré, who has already gone. If you hear a cannonade on the side of Eckmühl, because it might be possible that the enemy had moved forward and that there were an engagement, sustain it in whatever position you may be. As soon as the enemy will evacuate and make his retreat to return, push him by putting Oudinot in the first line and your tired divisions in the second line. NAPOLEON."

An hour and a half later the following was added:

"P. S.—It is four o'clock. I have resolved to put myself on the march and shall be on Eckmühl at noon and ready to attack the enemy vigorously at three o'clock. I shall have with me 40,000 men. Send me *aides-de-camp* with Bavarian escorts to acquaint me with what you have done this morning. It seems to me that by taking (the road) either through Rohr, or Rottenburg or Langquaid, they will not fear falling into the enemy's hands, since having the inhabitants on our side they can conceal them.

I shall be in person at Ergoldsbach before noon. If one heard the cannonade that will tell me sufficiently that I must attack. If I do not hear it and you are in position to attack, have a salvo of ten guns fired at once at noon, an equal number at one o'clock and an equal number at two o'clock. My *aide-de-camp* Lebrun will leave at 4.15. I have decided to exterminate the army of Prince Charles to-day or at the latest to-morrow.

This letter is for the Duke of Danzig; communicate it to him."[23]

In the interim Napoleon had the following "Orders dictated to the Major General."

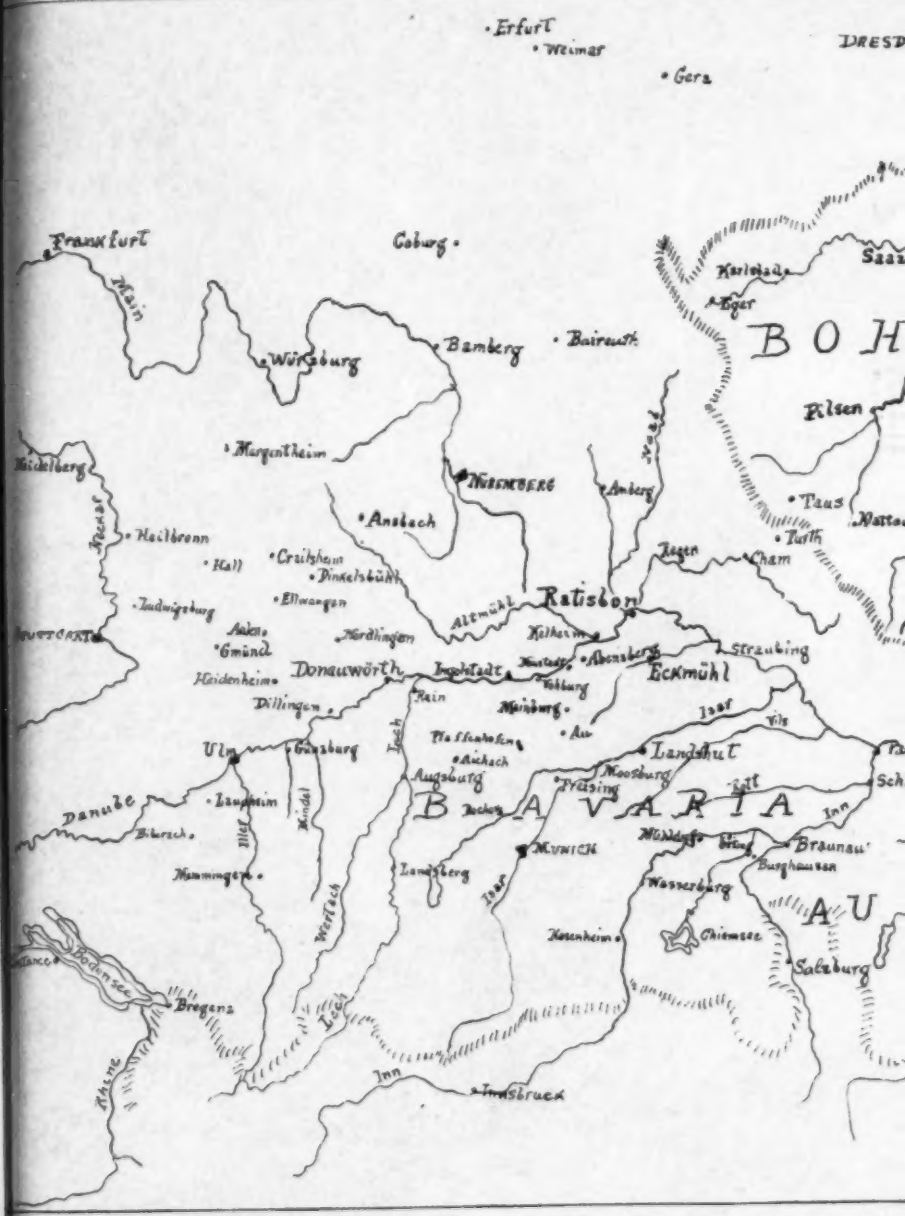
"Landshut, April 22d, 1805. 3 A. M.

"Give the order to General Wrede to leave with his division to support the movement of Marshal Bessières who slept this evening at Geisenhausen, so as to throw the enemy the farthest one can onto the Inn. The Bavarian division will leave its actual position at 4 A. M.

Order the Duke of Rivoli to assemble between Landshut and Ergolding, in the plain, three of his divisions, their artillery, (and) Es-

[22] "In order for an army to be ready to fight it must be united." Napoleon, Campagnes d'Italie de 1796 et 1797. 5th observation. Corresp. vol. 29, pp. 336–337. Compare Hamley, p. 152. The italics are ours.

[23] Napoleon, Corresp. 15,104, vol. 18, pp. 493-494.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Heidelberg
Neckar
Marcentheim
Wernberg
Amberg
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Heilbronn
Hall
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Ansbach
Tirth
Jagst
Cham
Pinzelsbühl
Ludwigsburg
Ellwangen
Ratisbon
Altmühl
Aalen
Nördlingen
Kelheim
Straubing
Gmünd
Donauwörth
Ingolstadt
Abensberg
Eckmühl
Heidenheim
Tölburg
Dillingen
Main
Münburg
Isar
Vils
Ulm
Günzburg
Iller
Pfaffenhofen
Aichach
Landshut
Augsburg
Moosburg
Danube
Leipheim
Freising
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Mindel
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Munich
Mühldorf
Braunau
Burghausen
Memmingen
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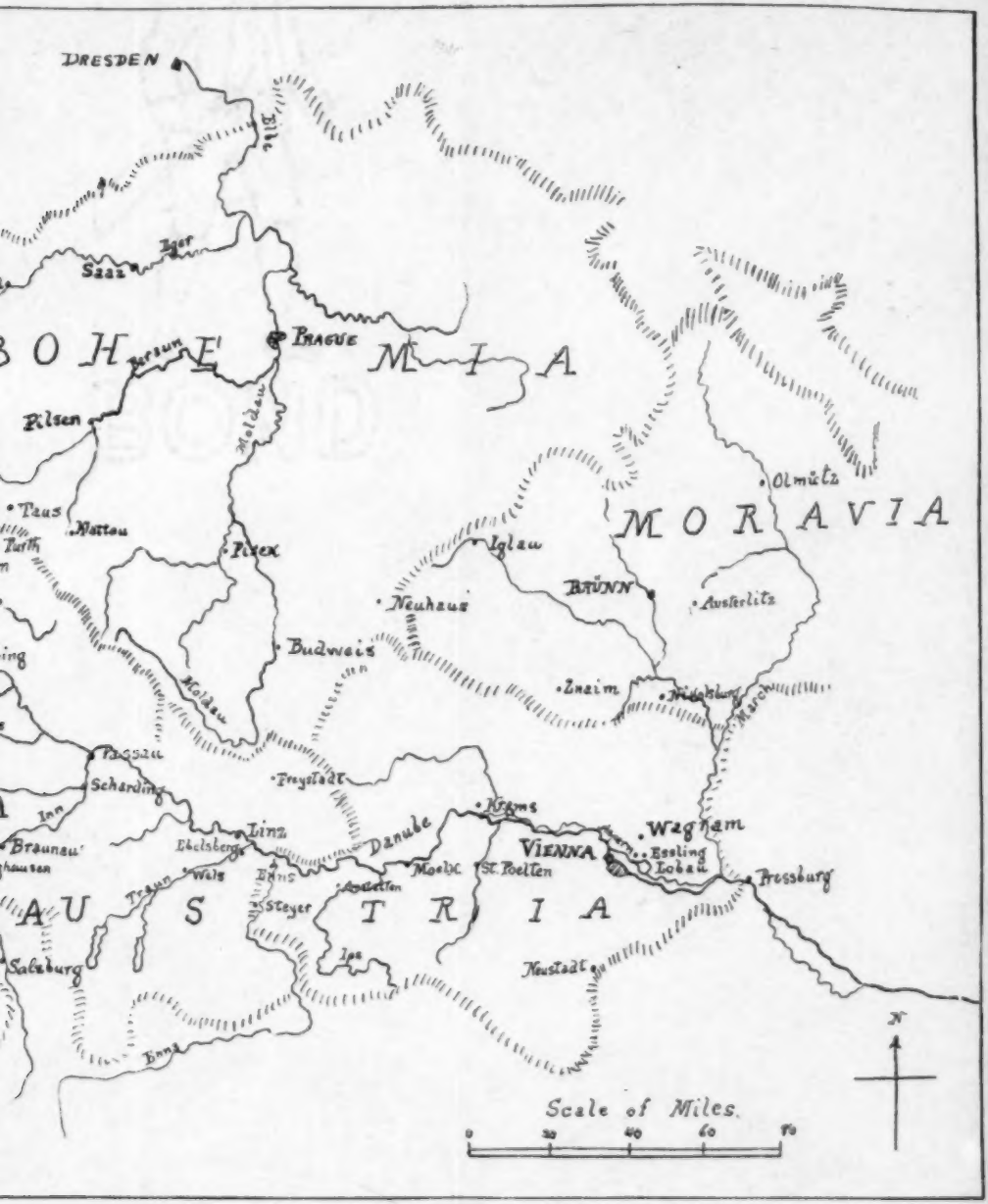
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Neuhaus
Iglau
MORAVIA
Olmütz
BRÜNN
Austerlitz
Znaim
Nicholsburg
March
Passau
Scharding
Inn
Freystadt
Krems
Wagram
Braunau
Linz
Ebelsberg
Danube
VIENNA
Essling
Lobau
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pagne's division. He will there assemble his divisions nearest here; the first division must be able to be assembled on the left bank at 6 A. M., to be enabled to depart at once. The Duke of Rivoli will put himself on the march with his three divisions to direct himself on Eckmühl and to surround the enemy; the Emperor will march with him. The Fourth division will assemble at Landshut to guard the position and support, if need be, Marshal Bessières who is between the Inn and the Isar with the Bavarian division and the light cavalry.

Gudin's division will leave at 4 A. M. to reach Ergoldsbach at nine o'clock.

General Morand will leave at 5 A. M. to reach Martenshaun at nine o'clock. Saint-Sulpice's cuirassiers will mount at six o'clock and follow the movement of Gudin's division. They will be under the orders of the Duke of Montebello.

To General Rouyer: The Duke of Auerstädt having sent Boudet's division to Ingolstadt, it is sufficient to defend the Altmühl; however His Majesty does not bother further about the Danube. If there were extraordinary circumstances, he must cut all the bridges and confine himself to guarding Ingolstadt."[24]

Marshal Lannes was informed that,

"The Duke of Auerstädt is always fighting. General Vandamme has departed with the Wurtemberg infantry and three regiments of light cavalry to march on Eckmühl. I desire you to leave so as to have arrived at Ergoldsbach at seven o'clock; you will take Saint-Sulpice's division in passing Essenbach. You will push the Wurtembergers before you as far as Neufahrn and even to the little river of Laber. Independently of the Wurtembergers, and Saint-Sulpice's cuirassiers, you will have under your orders the divisions of Gudin and Morand.

I shall myself move there as soon as possible. You will acquaint me with the news you will get from this side. You will choose a good position on the little river of the Laber. My intention is that, as soon as you will have received news from Marshal Davout, you should march on Eckmühl and attack the enemy on all sides. I am having your movement supported by the Duke of Rivoli and his three divisions which have just arrived. Since the enemy is obstinate, he must be exterminated. *Have Gudin's division leave without losing a moment; these troops cannot leave too quickly.*"[25]

The Emperor then turned his attention to the pursuit of the Austrian left wing and at 3.30 A. M. wrote to Marshal Bessières:—

"My Cousin,

"I know that you have arrived at Geisenhausen. I should have desired to have reports on the enemy's force. The Bavarian division of General Wrede is going to join you. I shall leave to-day to surround the corps of the Austrian Army of Bohemia which have come to Eckmühl. I shall have with me the Duke of Rivoli and three of his divisions, so that there remain to you General Wrede and the 4th division, in reserve before Landshut.

P. S. Evince a great deal of confidence in General Wrede."[26]

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[24] Napoleon Corresp. 15,105, vol. 18. p. 495

[25] *Ibid.* 15,106. pp. 495-496. The italics are ours.

[26] Napoleon, Corresp. 15,107, vol. 18, p. 496.

Later the final letter was sent to Davout,

"My Cousin,

"I have talked with General Piré and a quarter of an hour later I sent you one of my orderly officers. I am sending you my *aide-de-camp* Lebrun to inform you that I am directing on Eckmühl the divisions of Gudin and Morand, Saint-Sulpice's cuirassiers and a brigade of the Wurtembergers. The Duke of Rivoli will follow with three divisions and Espagne's cuirassiers. *Concert with the Duke of Danzig upon what you ought to do in case of attack, in whatever position you may be, and arrange so that the divisions of Oudinot and Boudet may participate in the battle as well as the divisions of the Duke of Danzig*[27]—viz.: two divisions of Bavarians and Demont's division. If Prince Charles remains to-day, and the position is attackable, I hope to attack him at four o'clock, above all if I hear you engaged. Send me by the cross-road some Bavarians who will come to join me and give me news of you. If there is possibility of joining me, the Duke of Danzig may send a strong detachment to connect with me. The Austrian army must be exterminated and the regiment which was captured avenged.[28] NAPOLEON."[29]

Meanwhile, the Archduke, baffled for two entire days by Davout, had determined to take the offensive during Napoleon's absence on the Isar and, by throwing his right, strongly reinforced, on Abbach, to issue onto the French communications which he naturally presumed still remained along the southern bank of the Danube through Neustadt to Donauwörth.[30] He therefore ordered Kollowrath to cross the Danube and march to Abbach, preceded by Veczay (26,600)[31]; the 2d column under Lichtenstein to move at 1 P. M. through Weillohe on Peising (12,600); the 3d column under Hohenzollern (8000) at noon through Luckenpoint and Dinzling toward Peising; Rosenberg (12,400) was ordered to defend the position of Laichling during the attack by these columns and if pressed to retire on Hauss to cover the left. The grenadiers (900) were formed up in columns in reserve, the cuirassiers (300) were placed at Thalmassing and Köfering and Vukassovich with 5800 (Hohenzollern's

[27] The italics are ours. Note the observance of the "General rule: When you wish to fight a battle, assemble all your forces. Do not neglect a single one; a battalion sometimes decides the day." *Supra.*

[28] The 65th under Colonel Coutard which had surrendered at Ratisbon.

[29] Napoleon, Corresp 15,108, vol. 18, pp. 496-497.

[30] The wisdom of Napoleon's changing his line of operations was then manifest and the advantages of this able manœuvre fully reaped, since "an army which changes its line of operations deceives the enemy who no longer knows where are its rears and the delicate points by which he can threaten it." Napoleon, Précis des guerres de Frédéric II., 10th observation. Corresp. vol. 32, p. 184.

[31] Kollowrath moved only 8 miles in the time in which Napoleon marched 23 that day.

corps) remained to guard the defile of Eckmühl, under Rosenberg's orders. The army thus backed to Ratisbon faced west. The Archduke with 77,400 at his immediate disposition—while Bellegarde with 27,000 was on the opposite bank at Hemau,—accordingly fully expected to be able to drive Davout back on Abensberg, but this determination—which would have been of inestimable advantage had it been carried out on the 19th[32]—was destined to produce only disaster.

A thick fog obscured the entire country until 8 A. M. and when it lifted the opposing forces were discovered in very nearly the positions of the previous sunset. The enemy's advance toward Abbach raised the greatest apprehensions in Davout's mind who anxiously awaited the arrival of reinforcements, but the French line extending from near Abbach to the Laber (Lefébvre and Nansouty) spent the morning watching the slow movements of the Austrian columns made with the precision of parade. About noon Davout's heart was gladdened by the distant roar of guns in the direction of Landshut which brought the welcome tidings of the arrival of Napoleon with the bulk of the army[33] on the enemy's extreme left, and he promptly ordered a general attack against the plateau.

The guns which Davout had heard were those of Vandamme's Wurtembergers (12,000) preceding Lannes (19,000), Masséna (24,000) and Espagne's cuirassiers (1600), a force of 56,600 men which, added to those already in position gave Napoleon a total of 105,000 as against 77,400 under the Archduke.

Vandamme promptly attacked Vukassovich and drove him from the villages of Buchhausen and Lintach on Rosenberg who immediately sent to the Archduke for reinforcements and retiring behind Laichling, posted troops on the heights of Eckmühl to cover the road to Ratisbon. After a short conference with his marshals, Napoleon fixed upon the village of Eckmühl as the key which would unlock the road to Ratisbon, turn the

[32] Compare Jomini, Grand Military Operations, vol. 2, p. 453. "It is not sufficient to bring about a good operation in war by bringing our masses skillfully to bear upon the most important point. It is necessary to know how to engage them there."

[33] "The strength of an army, like the power in mechanics, is computed by the product of the mass by the rapidity." Napoleon, Observations sur les campagnes de 1796 et 1797. 2d observation, vol. 29, pp. 327-328.

XUM

Austrian left and cut it off from the lower Isar and the Danube; and under his own supervision made the Wurtembergers storm the bridge and village. The Austrians fought with the utmost fury and several times repulsed the Wurtembergers, during which Rosenberg moved his left to the wooded heights bordering the marshes of the Laber. If sufficient time could be gained to get up artillery and to occupy the woods and hills of Roking in the rear the position could be made impregnable, and to prevent this Lannes sent forward his voltigeurs. They had halted at the edge of the stream to await Gudin when one of Masséna's *aides-de-camp*, Captain Pelet, put himself at their head and led them across the stream and up the heights where they drove off the enemy and, seconded by Gudin, repulsed all attempts to retake this dominating position, and assisted the Wurtembergers to carry Eckmühl.

On Gudin's left, Lannes decided to cross the Laber and to support the former's attacks against Vukassovich and Biber (St. Julien's division of Hohenzollern's corps) in the Roking wood while the cavalry formed line between Schierling and Eckmühl—the Bavarians on the left, the Wurtembergers in the centre, and the French on the right—and charged up the slopes, while on the extreme left Davout had carried the strongly fortified village of the Unter-Laichling and the wood in the rear, protected by abatis, with Saint-Hilaire's division, and on his left Friant had driven the enemy back to Ober-Santing. Rosenberg had been forced to throw his left back at an angle in order to face toward Eckmühl as well as toward Laichling; his troops fought with splendid stubbornnesss, compelling St.-Hilaire to his utmost efforts to obtain possession of the road of Laichling, while the cavalry by desperate charges succeeding in saving most of the guns. These accidents of the ground were such that the French and Bavarian attacks achieved no great result until the French cuirassiers directed to complete the discomfiture of the regiment of Stipsicz in disorder behind Unter-Laichling, charged home so brilliantly that Lannes' troops on the heights stopped to applaud and cheer them.

Meanwhile the Archduke had ordered Kollowrath to retrograde from Abbach and take position between Isling and the Galgenberg under Ratisbon; Lichtenstein to move between

Gebelkofen and Thalmassing, and Hohenzollern between the latter village and Santing, but this latter corps was so deeply engaged with Friant that it could not be withdrawn until a gallant attack by the Ferdinand hussars had checked the French advance. The grenadiers were retired through Egglofsheim and Köfering and a brigade of cuirassiers (Lichtenstein) posted before the Headquarters. The result of these dispositions was to place the army in echelons from Santing to Thalmassing and from Gebelkofen to Isling, in a column parallel to the high road with the grenadiers far in the rear and the cuirassiers on the road. The battle had commenced by a series of isolated attacks on the part of the French due entirely to the broken terrain, but when Napoleon observed this concentration about Ratisbon he ordered Lannes who had been placed at the decisive point to push forward and to turn their left, and by his own presence animated this attack. This would in itself have been sufficient to overturn the Austrian line, but Davout had already contributed most puissantly and the Austrians' infantry and cavalry had begun to retreat, abandoning there many of their pieces which the heroic gunners defended until overpowered. Napoleon then ordered forward all his cavalry along the road to Ratisbon and directed a general advance of his entire line—Davout on the left through Santing, Lefébvre with the Bavarians and Demont on his right, the cavalry in the centre and Lannes on the right through Pfakofen and Gailsbach, followed by Oudinot and Masséna, forming a powerful reserve, to the Laber.

In vain did the Austrians endeavor to stem their irresistible advance. Prince Rosenberg and his officers exposed themselves with the utmost fearlessness and the splendid manner in which their men sustained the attacks of the entire French army for 3 hours when pressed in front and on both flanks, with but few reinforcements, must excite the greatest admiration. They were ultimately compelled to retire from Santing on Egglofsheim, covered by cavalry and artillery on the heights behind the defile of Höheberg. Instead of throwing a corps against Davout to check his advance and making a change of front on the centre, the Archduke with his right toward Abbach and his left near Köfering seems to have been much more concerned to save his troops than to gain the battle, and since many of his

divisions were not put into action at all there was a decided scarcity of reinforcements sent to those already engaged, in which respect no one was more neglected than the gallant Rosenberg. He held for some time the position of Höheberg, but the sloping ground to the west uncovered his left, and when the French line advanced, Rosenberg, despite his persistent attacks, turned on both flanks and overthrown in front, was forced to retreat through Hagelstadt beyond Egglofsheim where another desperate stand was made.

As the French debouched from the various woods and copses Napoleon reformed his line at the edge of the vast plain which extends to the Danube, while the Archduke to reëstablish order among his confused infantry echeloned it on the cross-roads under the protection of a last reserve of cuirassiers and hussars, formed up before Egglofsheim and supported by several battalions and some grenadier battalions. About 7 o'clock Napoleon directed his light cavalry forward and to the right, and supported it by the cuirassiers of Nansouty and Saint-Sulpice. A few charges were exchanged and the Austrians, who should have confined themselves to gaining time in order to cover the retreat of the infanty and artillery, then attacked with the utmost fury. The French moved forward to meet them and a terrific fight ensued, lighted by the rising moon, until the exhausted Austrians broke and fled in greatest confusion vigorously pursued by the cuirassiers who rode through and over everything as far as Egglofsheim. Close behind them was Napoleon with his marshals, of whom Lannes proposed to follow the enemy to the Danube,[34] but the others objected because of the excessive fatigue of the troops most of which had marched that morning from Landshut, the dangers of an engagement at night, the resoluteness which the enemy had begun to show and the resources of Ratisbon for an obstinate defense. Napoleon therefore decided to suspend all further advance and ordered his hungry and weary troops to bivouac in a broad bow from Santing to the Danube while he occupied himself the Archduke's Headquarters of Egglofsheim.

Thus ended the battle of Eckmühl in which the Austrians lost 6000 men, 5000 prisoners and 12 guns, and the French

[34] Compare Thoumas, Le Maréchal Lannes, p. 287.

about half that number. So faulty were the Archduke's dispositions that he did not have more than 47,000 men engaged until the close of the battle whereas, although neither Masséna or Oudinot's corps so much as fired a shot, Napoleon defeated them with 80,000 men. This battle, while by no means one of the first magnitude, is a masterpiece of resolution and manœuvres.

The situation of the Archduke was indeed critical; his troops were so fatigued, and utterly discouraged and demoralized and weakened by the loss of the reserve parks and ammunition train at Landshut that in spite of the 80,000 men at his disposition he did not dare hazard a battle cooped up in the *cul-de-sac* formed by the Danube, with the chances of his being driven into the river by the irresistible and ubiquitous Napoleon. A second bridge therefore thrown across just below the confluence of the Regen and during the entire night his forces defiled with such expedition that at noon next morning everything, troops, artillery, ammunition wagons were safely on the left bank, with the exception of the cavalry left to cover the movement and General Floshei with 6 battalions to occupy Ratisbon. The French were amazed next morning to find the plain deserted except for the cavalry rear-guard which Napoleon had ordered attacked at 9 A. M. while Masséna was directed on Straubing to seize the bridge and bar all retreat in that direction by both banks of the Danube.[35] The Austrian cavalry was soon routed and retreated toward the Abbach gate to draw off Lannes, but that marshal reached the lower bridge in time to bring up his guns and to throw Lichtenstein's corps also into disorder as it crossed under the protection of artillery fire from the left bank and destroyed the bridges.

The Austrian rear-guard had got into Ratisbon and closed the gates but when Napoleon arrived with Masséna and Davout he massed his artillery, formed a breach and ordered an assault, and while consulting with Lannes in a very exposed position he was slightly wounded in one heel but was obliged to remount to calm his anxious soldiers. Lannes directed his guns against one house at the edge of the *fosse* and over the débris thus filling the ditch his aides, Marbot and Labedoyère, led one

[35] Napoleon, Corresp. 15,110, vol. 18, pp. 497-498.

of the most brilliant assaults and escalades in history; Ratisbon fell and on the morning of the 24th not an Austrian regiment remained south of the Danube and west of the Inn.

It is not our purpose here to follow the future operations in detail. The Archduke retreated precipitately into Bohemia followed by Davout, while Napoleon sent Lefébvre to occupy Munich and himself pushed on through Landshut after Bessières, driving Hiller, Louis and Kienmayer before him. Davout was then withdrawn to follow the French army which continued down the right bank through Braunau, Ebelsberg—where the Austrians endeavored in vain to check its advance, (May 3d)—to St. Poelten. Part of the Austrian left wing crossed at Krems to the right bank where the Archduke had advanced from Budweis on Linz but, anticipated there and at Krems and finding both bridges destroyed, continued down the left bank. On May 13th Napoleon entered Vienna and on the 19th attempted to cross through the island of Lobau in the face of the concentrated Austrian forces. The bloody battles of Aspern and Essling (May 21st and 22d)—in which the intrepid Lannes was mortally wounded, to die a week later in awful agony—forced him to retreat into Lobau, which was converted into an entrenched camp on a scale of thitherto unknown magnitude, there to await the arrival of Prince Eugene, from Italy. The Archduke John had signally defeated Eugene at Sacile on April 16th, but the French successes in Bavaria and consequent rapid advance down the Danube had forced him to retire into Hungary followed by the Viceroy, who was thus enabled to join Napoleon on May 26th. On July 2d the invariable concentration for battle was begun "and never in modern times, probably never in the history of the world, was such precision witnessed in the movements of corps converging together from such distant quarters."[36] On the night of the 4th the French began to issue from Lobau and on the 6th Napoleon, at the head of 180,000 men, fought the bloody battle of Wagram, which ended in the Archduke's retreat into Bohemia. The armistice of Znaim (July 12th) terminated hostilities, and the definitive Treaty of Vienna (October 14th) wrested from the

[36] Alison, vol. III. pp. 244-245.

Austrian Empire 50,000 square miles and more than 4,000,000 inhabitants.[37]

These successes were rendered possible only by the marvellous manœuvres terminating at Eckmühl. In six days after arriving at Donauwörth Napoleon had extricated his troops threatened with disaster, brought order out of chaos, withdrawn Davout from his dangerous isolation, concentrated on his own centre, separated and driven the Austrian left back to the Inn, gained possession of the enemy's communications, and had defeated the Archduke and forced him across the Danube.[38] In three days had fought three successful pitched battles and had killed, wounded or captured more than 24,000 men. This "Five Days' Campaign" is without parallel in history[39]—alone it would have sufficed to immortalize such consummate genius, for never was success more brilliant or decisive and never was it better deserved.[40] In his dying days at St. Helena the Emperor recurred with constant pride to the strategy of Eckmühl,[41] and in his Commentaries himself wrote that "The battle of Abensberg, the manœuvres of Landshut, and the battle of Eckmühl were the most brilliant and the ablest manœuvres of Napoleon."[42]

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[37] Fyffe, vol. I. p. 430.

[38] "So rapid had been the movements that Napoleon's household had not been able to follow him, and that he had to live like a soldier, riding only borrowed horses." Ménéval, Memoirs, vol. 2, p. 210.

[39] In reward for his remarkable skill and gallant conduct the Emperor, on November 28th, 1809, created Marshal Davout, Prince of Eckmühl.

[40] Jomini, Life of Napoleon, vol. III, p 42.

[41] Lord Rosebery, Napoleon: The Last Phase, p. 212.

[42] Napoleon, "Notes sur le manuscript venu de Sainte-Hélène," Corresp., vol. 21, p. 235.

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FORT RODMAN RETURNING FIRE.

THE COAST JOINT MANŒUVRES—1902.

I.

ARTILLERY DISTRICT OF NARRAGANSETT.

By Major JOHN P. WISSER, Artillery Corps, U. S. A.*

THE drill and training of Navies and Armies in time of peace, preparatory for war, has been in vogue since navies and armies existed. But, in the past, especially in the more recent past, after the well-drilled lines of Frederick the Great began to lose their power, and armies became more mobile and their lines (or columns) of attack more flexible, it was found that barrack-square drill was not sufficient training for field service. It was the old story: In laying too much stress on the mere *forms* the world lost sight of the *spirit* of these exercises. Some other mode of preparation for actual war became a necessity, and thus arose the idea of having the so-called manœuvres, which, after receiving enormous development in the great European armies, spread to the smaller ones, until now there is scarcely an army worthy of the name but has its annual manœuvres, and the Navy has found it necessary to practice in the same way and that on a large scale.

The prime object of these manœuvres is to test the material, personnel and system of organization, administration and tactics of a fleet or an army under conditions simulating those of actual war as nearly as possible in time of peace. The more specific purpose of the recent Army and Navy manœuvres in this vicinity was to test the training of the personnel and the efficiency of the material, as well as to subject the adopted or proposed systems of fire control and direction to trial under war conditions,

* Colonel H. C. Hasbrouck. Arty. Corps, commanding the District, afforded me every opportunity to obtain the necessary data for this article. I am also indebted to Major John McClellan, commanding Fort Greble, for the data regarding his post and subpost (Fort Rodman), to Major John A. Lundeen, Arty. Corps, commanding Fort Wetherill, and to 1st Lieut. John S. Johnston, Arty. Corps, commanding Fort Rodman.

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and to study problems of attack and defense relating to the coast.

ORGANIZATION.

The District of Narragansett comprises the following forts:

Fort Adams, R. I. Fort Greble, R. I.
Fort Wetherill, R. I. Fort Rodman, Mass. (attached.)

It was under the command of Colonel H. C. Hasbrouck, Artillery Corps, District Commander, Captain H. C. Schumm, A. C., District Adjutant.

Each of the forts was organized as a single fire command.

The District Commander's station was at Fort Adams, R. I. for central direction in the Administration Building, in action at the Fire Commander's station on the old fort walls. The field of fire of the different fire commands was not visible from the station at Fort Adams, consequently only general directions could be given to the various fire commanders.

At Fort Adams the field of fire of the mortar battery (Battery Greene) was not visible from the Fire Commander's station beyond the eastern channel, consequently, for the part of the field of fire outside the channel the commander of Battery Greene was authorized to act as fire commander. The field of view of the vertical-base position finder was very limited and mostly cut up into small sectors, therefore a horizontal-base system was established at three stations, namely, Castle Hill, Brenton's Point and Price's Neck, covering the area immediately outside the channel. A longer horizonal base (from Beaver Tail to Sakonet Point, for example) would have been established but there was no *cable* to be had. Another base line, to cover Easton's Bay, was selected and oriented, but the Signal Officer did not make the necessary connections with the mortar battery, because he was afraid he could not maintain so long a line in effective operation.

At Fort Wetherill two extra 15-Pdrs. on hand were placed in an improvised emplacement in the new batteries being constructed on the hill. There was no telephone available to connect this battery with the F. C. station, and no officer could be spared to take charge of it. A corporal was placed in command with general orders for firing on ships entering the channel. For the other emplacements fire command was exercised.

At Forts Greble and Rodman true fire command was exercised.

The garrisons for the different forts were as follows:

Fort Greble, R. I.

Major John McClellan, A. C., Fire Commander.
72d, 109th, 45th and 103d Cos., Coast Artillery.
Batteries E, F and M, 1st Regt. Mass. Heavy Artillery.

Fort Wetherill, R. I.

Major John A. Lundeen, A. C., Fire Commander.
76th and 77th Cos., Coast Artillery.

Fort Adams, R. I.

Major John P. Wisser, A. C., Fire Commander.
78th, 79th, 97th, 110th, 74th and 107th Cos., C. A.
Batteries G, H and L, 1st Regt., Mass. Heavy Artillery.

Fort Rodman, Mass.

Colonel James A. Frye, 1st Mass. Heavy Artillery, Tactical Commander.
1st Lieut. J. S. Johnston, A. C., Fire Commander.
Detachment of 21 men from 109th Co., Coast Artillery.
Batteries A, B, C, D, I and K, 1st Regt. Mass. Heavy Artillery.

TACTICS.

The District Commander, for want of a proper station overlooking the entire field of fire of the district, or even the more important part of it, outside the two channels, could exercise little direct control. He was therefore compelled to content himself with general directions for the distribution or concentration of the fire of the different fire commands in Narragansett Bay, and Fort Rodman (near New Bedford, Mass.) was entirely out of the sphere of direct control by him.

The following order prescribed the tactical duties of fire-commanders and the principle of action under different circumstances:

Headquarters Artillery District of Narragansett,
FORT ADAMS, R. I.,
August 4th, 1902.

General Orders.
No. 1.

The following instructions relative to the proposed manœuvres, to take place between the Army and Navy, are published for the information of all concerned:

SCHEME OF DEFENSE.

The object of the artillery defenses of the District will be:

1. To prevent a bombardment by silencing the fire and putting out of action all the ships in the order of their importance and armament, that may engage in it.

2. To prevent the forcing of a passage.

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3. To prevent any ship to approach within range for reconnaissance or any other purpose.

It is expected that the Red Fleet will attack by:

a. Bombardment at long, medium or short range.

b. By attempt to run past.

c. By the advance of a single or a few ships to make a reconnaissance of the batteries of the defense.

BOMBARDMENT.

If, in case of a bombardment, the ships fire in succession as they reach a buoy, selected or dropped for the purpose, or from a fixed point determined by bearings, all batteries that can be brought to bear will fire at each ship at the set-back point from the buoy or fixed point at which the ship's fire is delivered.

If the size of the curve described by the ships and their distance apart is great enough, and the rate of speed is low enough, to make the ships arrive at their firing point at intervals sufficient for the service of the guns, each ship will be fired at as it arrives at the set-back point.

If the ships arrive in succession at the fixed firing point at intervals less than the time required to serve the guns, then without materially diminishing the rapidity of the salvos, the most formidable ships will be selected as targets as they arrive at the firing point.

If the curve described by the ships is irregular and if they do not fire from a fixed point, the most formidable ships will be selected as targets, and the predicted position be located where they will be *broadside* on, with short or medium ranges, or when *end on*, with long ranges and exposed to deck-piercing projectiles.

The fire of mortar batteries during a bombardment, will be conducted on the same principles, bearing in mind that an *end on* position of the target is more favorable, other conditions being equal, for attack by vertical fire at all ranges.

If the ships should take the hazard of bombarding from *at anchor*, the fire will be concentrated or distributed as the situation may demand.

FORCING A PASSAGE.

In case of an attempt to run by in single column, the fire of every gun and mortar bearing upon the channel of approach will be concentrated upon the leading ship as soon as it comes in range. The object will be to put the leading ship out of action, and thereby make the column unmanageable. When this is accomplished and the attacking column is in confusion, fire will be distributed. When the advance is resumed, fire will be concentrated on the leading ship. If the ships advance in double column, the batteries will concentrate their fire upon the leading ship on their side of the channel.

If a single or only a few ships advance towards the defenses, a sufficient number of guns will open fire in order to stand them off. If the ships are unarmored or of low rate only rapid-fire guns or guns of low calibre will be used to prevent the enemy from determining by these means the position and armament of all the batteries of the defense.

GENERAL PRINCIPLES.

Every fire commander who discovers a ship of the Red Fleet within his fire area, before his attention has been called to its presence by the District Commander, will open fire according to the principles above described.

Battery commanders will change target in compliance with the orders

of the Fire Commander, or on their personal responsibility in case of emergency. Battery commanders will order the ammunition to be used, and each commander of a fixed gun battery will indicate on his chart, the zones within which the different kinds of shot and shell will be used, as prescribed on page 12, Major Whistler's pamphlet on *Fire Control and Direction*. Each mortar battery commander will indicate on his chart the zones within which the various shell will be used.

The system of *Fire Control and Direction* prepared by Major Whistler, and authorized by the Secretary of War, will be used during the manœuvres. The methods therein prescribed for the determination of the predicted point and set-back point, the use of the electric searchlight, illuminating and blinding lights, and the location of targets by day and night, will be employed.

* * *

By order of Colonel HASBROUCK,

HERMAN C. SCHUMM,
Captain Artillery Corps,
Adjutant.

In addition to these general instructions, the District Commander ordered the Fire Commanders of Forts Wetherill and Adams, in case of a run past or an attempt to force the entrance in column, to divide the fleet between them, so that Fort Wetherill would take the first, third etc. vessel in column, while Fort Adams would take the second, fourth, etc.

Moreover, Fort Greble received more specific instructions as to the ranges at which targets are to be taken up by the different guns, the number of rounds, volleys or salvos to be fired on each kind of ship by the various pieces or batteries and the order in which the vessels of attacking columns are to be attacked. If the enemy approached in single column, fire was to be concentrated on each ship in succession beginning with the leading vessel; if in double column the head of the right column was to be taken first, then the head of the left column, then the second of the right, second of the left, and so on.

The Fire Command of Fort Adams really comprised three fire commands. The Fire Commander himself directed all action inside of the eastern channel, Captain Mauldin, commanding Battery Greene, directed all fire in the single large sector of fire visible from his vertical-base position finder station, and Captain Coe, in charge of the horizontal-base system, with station at Price's Neck, directed, all fire on the outside area not visible from the vertical-base position finder.

The Militia was utilized to complete the reliefs at the batteries and to resist the attacks of landing parties.

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The search-lights could not be divided into search, blinding and fighting lights, because there were too few available. Fort Adams, for example had but four, one for the Fire Commander's station, one each for Batteries Reilly (10-inch) and Talbot (4.7-inch R. F.) and mobile armament, and one for the horizontal-base system at Price's Neck. These were used as search and fighting lights indifferently.

The Fire Commander's light at Fort Adams was kept on the mouth of the channel, constantly moving at a slow rate from Castle Hill to Beaver Tail and back. Occasionally the other two lights (Batteries Reilly and Talbot) were thrown up the bay because a boat attack in rear, by way of Sakonet River, was among the possibilities, and these lights were also turned on once an hour or so, to make sure that they were ready, their carbons adjusted, and to read the tide gauge. Captain Coe, at Price's Neck, believing that he could readily see large objects like warships, kept his light dark most of the time, only turning it on when required.

The Fire Commander at Fort Wetherill kept his light steadily in one position covering the mouth of the channel.

The area inside the channel was limited, in the case of Fort Adams, to a maximum range of about 3500 yards, from position finder stations or guns to mid-channel opposite Castle Hill, consequently little fire command could be exercised as that was very close to the range (2500 yards) at which a fire commander would turn his batteries over to the battery commanders anyway. Battery Reilly was therefore directed to lay its guns directly on the mouth of the channel and to *fire at will* (under the restrictions, of course, requiring this fire command to take the even-numbered ships in column). A similar order was given to the rapid-fire battery, the two batteries working together.

At night the search-light of the Fire Commander indicated the target to Battery Reilly, but the rapid-fire battery was left entirely to the battery commander.

The District Commander installed the mobile armament at Battery Talbot. It was available, however, for use at any point on the reservation to prevent landings or for other purposes. The battalion of the 1st Massachusetts Heavy Artil-

lery at Fort Adams was held in reserve to be used where needed. The men were armed with 0.45 calibre Springfield rifles. A detachment of 20 men, under Captain Whiting, was ordered to Price's Neck, to protect the station and the search-light there. Two Gatling guns were obtained to complete this protection; the latter were cal. 0.45, and there was no blank ammunition for them, but Captain Coe obtained some from the Militia. The rest of the 1st Massachusetts were ordered to hold themselves in readiness to proceed to Price's Neck, or wherever they may be required, at a moment's notice.

OPERATIONS.

The operations in this district comprised:

A Reconnaissance of Narragansett Bay.

A Bombardment of Fort Rodman.

A Bombardment of Forts Wetherill and Adams.

A Forcing of the Entrance to the Eastern Channel, Narragansett Bay.

The manœuvres began at midnight, August 29th, the first two days (up to midnight, August 31st), being regarded as a period of preparation, the actual operations beginning at midnight, August 31st, and lasting until noon, September 6th.

During the period of preparation the details of organization were completed, ammunition was prepared and target practice was completed; telephones and telautographs were installed at batteries and stations and communications were completed; electric firing gear was installed for the mortars, and search-lights were placed in position and tested; finally, the entire fire command at each post was drilled and practiced, by day and by night.

September 1.—Nothing of importance transpired in this district on the first day of actual operations, but information of the enemy and of his probable plans was constantly received from the Department Commander, from the commander of the New London district, or directly from the signal stations at Wood's Hole, Sakonet Point, Beaver Tail, Point Judith, Block Island, and Mt. Prospect (Fisher's Island). Our own station at Price's Neck, besides its proper work as a horizontal-base station, did excellent service as a lookout.

At 10.50 P. M. August 31st, word was received from the

District Commander that there was a rumor that an attack by the smaller vessels of the fleet would be made around the rear of the defenses here, by way of Sakonet River. The search-light of the rapid-fire battery (Battery Talbot) at Fort Adams, was therefore thrown up the bay occasionally throughout the manœuvres.

The Red Fleet, which had rendezvoused in Menemsha Bight Martha's Vineyard, got under way at 10.40 P. M. on August 31st, and started for Block Island. The *Olympia* was detached shortly after getting underway. She landed a company of marines at Gay Head, who occupied the signal station there, then proceeded to Wood's Hole on the main land opposite the northern end of Martha's Vineyard, and cut the cable connecting Martha's Vineyard with the mainland.

At 7.30 A. M., September 1st, the capture of Block Island by the navy was reported. At 5.30 P. M. that day the Department Commander sent information that the entire fleet (with the exception of the *Olympia* and *Nina*, anchored at Gay Head, Martha's Vineyard) was concentrated at Block Island, calling attention to the fact that this naval base was favorable for attack on any of our lines of defense.

At 8.10 P. M. word was received that the fleet was landing troops at Point Judith, and at 9.30 P. M. information came that the fleet would probably be divided, one squadron under Admiral Higginson coming against the western end of the line, and probably endeavoring to force a passage up the Race, the other squadron under Admiral Coghlan to move against Newport. At about 10.30 P. M. the attack on the Race was reported, including the information that eight warships (four of them battleships) took part.

September 2.—At 12 o'clock midnight Captain Coe, at Price's Neck, reported the fleet at the mouth of the bay. Call to arms was sounded at Fort Adams at 12.07 A. M., and Battery Talbot reported *Ready* at 12.14, Battery Reilly at 12.16 A. M.

Reconnaissance of Narragansett Bay.—This was evidently a reconnaissance by a portion of the fleet.

Admiral Higginson, in his report of September 6, states:

"After dark on Sept. 1 a Scouting Squadron, under the command of Commander Wilson, of the *Panther*, with the *Supply*, *Montgomery* and

Mayflower, got under way and scouted the enemy's coast from Price's Neck, Newport, to Fisher's Island. This squadron located the searchlights along this part of the coast and drew the fire of the forts at Newport while off Brenton's Reef Lightship. They returned and anchored off Block Island about daylight."

The vessels were visible from the horizontal-base stations, and the mortars (Battery Greene) were fired from the station at Price's Neck. The *leading vessel* was assigned as a target to that battery at 12-21-47, and two battery salvos (32 shots in all) were fired at it scoring $32 \times 50 = 1600$ points; ranges 6925 and 7185 yards; it was reported out of action at 12-38-32. The *third vessel*, or the one *with tallest masts and a headlight*, was then assigned to the same battery at 12-39-07, and received four battery salvos of the following values:

$16 \times 50 + 16 \times 50 + 16 \times 47 + 16 \times 44 = 3056$ points,

being declared out of action at 12-57-17 A. M. Ranges 7185, 7625, 9610 and 10,135 yards, respectively. The ranges were generally considerably within 10,000 yards, the last salvo being fired just beyond this range, the earlier ones at considerably shorter ranges.

The squadron had apparently located (at some previous time) the dead angles of the vertical-base position finder, because it took up a position therein, but it evidently had no suspicion of the horizontal-base system, established at and near Price's Neck. This is borne out by Admiral Higginson's report, in which he refers to "a signal and observation station at Price's Neck," and also by the fact that the fleet left immediately after the firing began.

The officer in charge at Price's Neck did not know the character of the vessels of this squadron, consequently he fired as if they were battleships.

At 12-57-17 the command *Cease Firing* was given, at 1.08 A. M. the squadron was reported retreating, and at 1.16 A. M. as out of sight from Price's Neck station.

September 3.—Bombardment of Fort Rodman.—At 8 A. M. a portion of the fleet under Admiral Coghlan, comprising the *Brooklyn*, *Olympia*, *Puritan*, *Montgomery*, *Mayflower*, *Peoria*, *Aileen* and *Gloucester*, attacked Fort Rodman, near New Bedford, Mass.

The squadron entered Buzzard's Bay at some time during

the night preceding the attack and came to anchor, the *Puritan* to the northeast of Penikse Island, and the rest of the ships off Cuttyhunk. At daylight the squadron, excepting the *Puritan*, got under way, and came up the bay, following the main ship channel until about off Mishaum Point, where it turned to the right until well out in the bay where it came to anchor.

During this movement fire was opened by the fort from the 8-inch guns at about 9000 yards, which first decreased to 8900 and then increased to 9600 at the anchorage. At this point the squadron was joined by the *Puritan*, and after a delay of more than an hour, during which time the regular rate of fire was kept up from both 8-inch guns, got under way advancing in column, the *Puritan* leading (with the gunboats *Peoria* and *Leyden* a little in advance and about 800 yards to her right) and followed by the *Olympia*, *Brooklyn*, *Montgomery*, *Mayflower* and *Gloucester* in the order named.

Owing to the fact that sub-calibre ammunition was used in her main batteries, it was impossible to tell just when the *Puritan* opened fire. The *Brooklyn* and *Olympia* opened fire with their main batteries at about 8000 yards. At about 7000 yards the squadron divided, one division, composed of the *Puritan*, *Olympia* and *Brooklyn*, preceded by the *Peoria* and *Leyden*, following the channel to the east of the chain of shoals extending from the Great Ledge to the North Ledge; while the other division, comprising the remaining ships of the squadron, turned to the left, and, passing between the Great Ledge and Dumpling rocks, followed the channel into Clark's cove, keeping as near the western shore as possible.

The 15-Pdr. batteries of the fort opened fire at 6500 yards. The left division of the squadron and the secondary batteries of the right division opened at about the same range.

Before it began its final advance, all the ships of the squadron, excepting the *Puritan*, *Leyden*, *Peoria* and *Aileen*, had been consecutively put out of action by the fire of the 8-inch guns. During the final advance the entire fire of the fort was concentrated on the *Puritan*, *Peoria* and *Leyden*. The 6-Pdr. battery of the fort opened fire at 5000 yards, and the 1-Pdrs. at 2500 yards.

The right division of the squadron continued to advance, the

Peoria and *Leyden* removing the obstructions from the channel, until the leading ship was about 900 yards from the east 8-inch gun, when they stopped, and after backing for some distance dropped anchor, maintaining a continuous and very rapid fire until the close of the action.

When the leading ship of the left division, the *Montgomery*, was off Ricketson Point, the *Aileen*, which had not previously been sighted, came out from under the lee of the *Montgomery* and proceeded at full speed up the cove. At the same time the *Gloucester* left her position at the rear of the column and at full speed passed to the left of the *Mayflower* and *Montgomery*, following the *Aileen*. As the object of this movement seemed to be to effect a landing, the reserve detachment with one Gatling gun were sent to the west shore to resist the attempt. This movement was executed very rapidly and in excellent order.

The *Aileen* proceeded up the cove until about 400 yards beyond the boundary of the reservation, when she dropped anchor. The other vessels of the division dropped anchor about the same time, and all maintained a rapid fire until the close of the action.

The ships that took part in the bombardment of Fort Rodman, except the *Brooklyn* and *Peoria*, left for the base on Block Island during the afternoon. These were reported on their way out to the base from Fort Rodman, Sakonet Point, Price's Neck, Battery Greene (Fort Adams), Fort Wetherill, Fort Greble and Beaver Tail signal station.

The *Brooklyn* had grounded while entering the harbor (about 7.30 A. M.) and was still there after dark, the *Peoria* remaining with her.

September 4.—No operations of any importance occurred in the District on the fourth of September.

At 9.10 A. M. the *Brooklyn* and *Peoria* left the vicinity of Fort Rodman on their way to the naval base.

At 3.45 P. M. the following order was sent to the batteries at Fort Adams:

"While heavy fog lasts, fire according to your own judgment.
WISSER, Fort Commander."

At 8.10 P. M., Major Dyer commanding the battalion of the 1st Massachusetts Heavy Artillery at Fort Adams, was directed

to send a patrol along the lines of wire (for horizontal-base system) as far as Castle Hill. Other patrols were sent from Price's Neck.

At 8.35 P. M. the station at Price's Neck reported:

"Boat rapidly approaching harbor, just extinguished lights."

At 10.39 P. M. the same station reported a suspicious looking vessel outside.

September 5.—Bombardment of Forts Wetherill and Adams.

On September 5th a bombardment of the forts covering the eastern channel took place, but previous thereto there was an operation on a small scale, which had considerable value to the Red Fleet.

At 12.37 A. M. the signal station at Beaver Tail reported a suspicious looking vessel coming from the southward, and at 12.50 A. M. shots were fired from Fort Greble at a small vessel supposed to be the *Peoria.*

She was picked up by the Fort Greble search-light at 10,000 yards range about midnight, and 12.30 A. M. was distinctly visible at 6300 yards. The following points were made on her by the guns of Fort Greble:

10-inch B. L. R., 600 points.
15-Pdrs. R. F., 40 points

or a total of 640 points. The 15-Pdrs. then simulated fire at her for over fifty shots, just for practice. The average range was 4000 yards. At 12.53 A. M. the vessel was declared out of action. This happened about midnight, or soon after, and taken in connection with the previous reports beginning with the report of 8.35 P. M. shows how completely she was under observation.

About 3.30 A. M. the Fire Commander at Fort Adams sighted a suspicious looking vessel coming around Beaver Tail, and kept his light on her. The search-light of Battery Reilly (10 in.) happened to be on, as the Fire Commander's search-light had just changed carbons, so the Fire Commander, when the suspicious vessel passed into the channel opposite Castle Hill, directed:

"*PREPARE TO LOCATE TARGETS.*"

By that time the vessel, which had had its lights out, showed

lights, and there were evidently no guns aboard. The Fire Commander, knowing there were no mines planted in the channel, also remembering that the guns in this fire command were short of blank ammunition (they had about one-third the number of rounds the other District had), and feeling that the decisive action in this District was yet to come, changed his mind and did not fire. The light of the Rapid-fire battery was, however, also turned on. The vessel was carefully observed all the way through the channel, past the forts, and into the inner harbor, and there was no sign of life aboard of her or the small vessel she had in tow, certainly no visible work going on that indicated countermining. This vessel turned out to be the *Peoria*, sent in to countermine the mines in the channel.

At 10.52 A. M. reports began to arrive, indicating the early coming of the fleet, the latter heading straight for Point Judith, about five miles out; at 12.09 P. M. they were reported from Beaver Tail, all the ships identified, but stationary. At 2 P. M. they were reported underway again, and at 2.01 P. M. the station at Price's Neck reported the *Indiana* and *Massachusetts* as having left the squadron, headed due east.

The *Brooklyn* and *Olympia* attacked a supposed signal station near Narragansett Pier, and put it out of action in twenty minutes, shelling from the secondary batteries.

The *Brooklyn* and some of the smaller vessels stood in toward the eastern channel entrance of Narragansett Bay soon after, and the mortar battery at Fort Adams was directed to open fire as soon as they came in range.

At 2.20 P. M. the *Brooklyn* and *Olympia* were seen from Fort Greble headed for the channel entrance; call to arms was sounded there and batteries reported ready in two minutes. The range of the vessels from Fort Greble was then about 10,700 yards.

At 2.27 P. M. they were assigned as targets to the mortars and 10-inch B. L. R. at Fort Greble, with instructions to fire two and three salvos, respectively, on the *Brooklyn*, and two salvos each on the *Olympia*, when the vessels arrived within range.

At the same hour exactly (2.27 P. M.) three of the smaller vessels headed towards Price's Neck, coming in full speed: *Montgomery*, *Mayflower* and *Scorpion*.

At 2.35 P. M. Fort Wetherill reported all ready, adding that the *Montgomery* was firing at the station at Price's Neck, and that the *Brooklyn* and *Olympia* were moving west.

The *Montgomery* was assigned as a target to the mortars at 2-38-00, and Captain Coe at Price's Neck fired a half-battery salvo (8 shots) at her, and put her out of action at 2-41-00 P.M.: points scored, $8 \times 50 = 400$.

At 2-43-30 the *Mayflower* was assigned to the same battery, and a half-battery salvo (by horizontal-base system) put her out at 2-47-15: points scored, $8 \times 50 = 400$.

Meanwhile, the mortar battery at Fort Greble fired one salvo at the *Brooklyn*. Before the Fort Greble mortars fired the second salvo the fleet came to anchor at 10,285 yards range from that point: this was about 3.16 P. M. The remaining salvos from the mortars and all the salvos from the 10-inch battery at that fort were fired while the vessels were at anchor.

The *Kearsarge* was assigned as a target to the mortar battery at Fort Adams at 2-47-15, and a battery salvo on her (fired by horizontal-base system) scored $16 \times 43 = 688$ points. At 3-09-30 the *Scorpion* was assigned to the same battery, a battery salvo, fired also by the horizontal-base system, putting her out at 3-29-48: points scored, $16 \times 57.5 = 920$. She was then stationary.

Captain Mauldin, at the verticle-base position finder station of the mortars at Fort Adams, seeing the *Montgomery* firing on the station at Price's Neck, although (as reported by Captain Coe) out of range, and fearing that Price's Neck station may be ruled out of action, opened fire with the mortars from his station.

The *Kearsarge* was assigned as a target at 3-09-00, and two battery salvos put her out at 3-11-58: points scored, $16 \times 47.5 + 16 \times 43 = 1448$. The *Alabama* was next assigned at 3-15-00, and two battery salvos put her out at 3-21-47: points scored, $32 \times 50 = 1600$. Another battery salvo was fired on the *Kearsarge* at 3-11-58, scoring $16 \times 50 = 800$ points more. The command *Cease Firing* was given at 3-34-00 P. M.

Fort Greble had scored 480 points on the *Brooklyn*, 640 on the *Kearsarge*, 640 on the *Olympia*, 520 on another vessel, unknown, and 640 on the *Alabama*. The command *Cease Firing* was given at 3.38 P. M.

Fort Wetherill opened fire on the *Brooklyn* with her 12-inch guns at 3.16 P. M., at a range of 9825 yards, firing ten shots, 4 at about 9825 yards, 6 at about 9150 yards, putting her out at 4.00 P. M.: score, 550 points. At 3.20 P. M. the *Olympia* was assigned as a target, and she received, at 9768 yards range, 2 shots, scoring 110 points at 3.23 P. M. The *Kearsarge* was then assigned as a target, and 19 shots were fired at her at 8675 yards, scoring 1045 points, and putting her out at 3-52-25. The *Alabama* was assigned as a target at 4.25 P. M., and she received 22 shots at 7400 yards range, scoring 1210 points, and putting her out at 4.57 P. M., when the command *Cease Firing* was given.

At 3-09-30 P. M. the *Scorpion* was assigned to the mortars at Fort Adams as a target, the firing being done through the horizontal-base station at Price's Neck. At 3-29-48 she was put out of action by one battery salvo scoring 920 points.

At 3.30 P. M. the station at Price's Neck was attacked by boats' crews (about 46 men) sent ashore from the *Montgomery*, but there were about 9 men of the detail there, besides 20 men of the militia, intrenched in a strong position, with two Gatling guns, and the rest of the battalion (about 50 men) of the 1st Massachusetts Heavy Artillery had been sent out in time to take station flanking the road leading to Price's Neck. The attacking force was therefore destroyed or captured.

The plan of the general attack on Narragansett Bay was to anchor the *Massachusetts*, *Indiana* and *Puritan* off Ochre Point, in Easton's Bay, and shell Forts Adams and Wetherill over the land, enfilading Wetherill and taking Fort Adams in reverse. The *Kearsage* and *Alabama* bombarding Forts Adams and Wetherill by zigzagging in the dead angle of direct gun fire of Adams, Wetherill and Greble; the intention being to pass inside and to the eastward of Brenton's Reef Lightship before turning out, but this was not done, because it was not considered advisable to risk the ships for the purposes of manœuvres inside the light-ship, where uncharted rocks might be run upon.

The bombardment from Easton's Bay (off Ochre Point) must have been of little value, because the target was not visible, and the effect of fire could not be observed; two circum-

stances that are accepted by artillerists as fatal to accurate *field* firing, therefore how much more so to the fire of ships on coast forts! Moreover, the high ridge of the Cliff Walk bordering Easton's Bay on the west, unless the ships were well off shore, must have interfered with the view from aboard ship, and possibly with the fire.

The bombardment from the vicinity of the lightship was not effective because the object of the Admiral was not attained, although there is, behind the lightship a dead angle against *direct* fire guns, as well as against pieces of *indirect* fire, that is, from the mortars at Fort Adams, but both only so far as the vertical-base position finder is concerned. The horizontal-base range-finding system, however, overcame this difficulty and covered even that dead angle. But then, even assuming that the horizontal-base system was put out of action by the destruction of the station at Price's Neck (which was not possible, since everything there was movable), the ships *did not get into the dead angle of the mortar battery D. P. F.*, but were plainly visible, especially the *Alabama* and *Kearsarge*. All the ships were fired on by all the direct fire guns of the forts in Narragansett Bay, except the 10-inch and rapid-fire guns of Fort Adams, and these last have no field of fire anyway outside of Castle Hill, with the exception of a sector of about 4 degrees adjacent to Beaver Tail Light; in addition, all the ships were fired on by the mortars of both Greble and Adams. They must, therefore, have been in the sector of fire of each and all the batteries, direct and indirect, except the 10-inch and rapid-fire batteries at Fort Adams.

A position inside the lightship, however, does exist, which is not under fire from any guns or mortars (unless a horizontal-base be used), beginning at a range of about 4000 yards from the Fort Adams guns, at a point northeast of the lightship, and running out to sea, formed by a line from Fort Wetherill through Castle Hill and a line from Fort Greble tangent to southern shore of Mackeral Cove, the angular opening being about 20 degrees. This space is limited by the large sector for mortar fire (Fort Adams), but still leaving a triangular dead space of the following dimensions: 2120 × 5720 × 4640 for the fleet to manœuvre in, giving ranges between 4000 and 10,000 yards.

Should the Mortar Battery P. F. station be put out of action this dead space will extend out to sea to a range of 21,000 yards before it is limited by the fire of Fort Greble down the western channel.

A horizontal-base system will, of course, cover the dead space, and those actually established did cover it, as was their main purpose.

The station at Price's Neck was declared out of action from 3-34-00 P. M. for one hour. It was reported in operation again at 4.45 P. M. The landing party was declared captured or killed.

The ships returning from Ochre Point, on their way to Block Island, came within range of the mortars, and were picked up by the station at Price's Neck: the *Massachusetts* at 5-10-20, receiving two battery salvos, the battery scoring $32 \times 50 = 1600$ points, putting her out of action at 5-43-19 P. M.; the *Indiana* at 5-46-50, receiving two battery salvos, the battery scoring $16 \times 44.5 + 16 \times 40 = 1352$ points, putting her out at 3-56-10 P. M., when the command *Cease Firing* was given.

Thus ended the bombardment of Forts Adams and Wetherill, and admitting that the fleet could have manœuvred in the dead angle inside the lightship, where there is an area of small extent with at least 12 fathoms of water, it was well conceived, and could have been executed with little loss, but also probably with little effect. But this area was covered by the horizontal-base systems of Wetherill and Adams.

Forcing of Eastern Entrance to Narragansett Bay—Run Past Batteries.—The decisive action in this District took place about 10.00 P. M., September 5th, and consisted in a run past the batteries, or a forcing of the eastern entrance to Narragansett Bay.

As early as 7.42 P. M., Major McClellan reported from Fort Greble that three warships were manœuvring around Beaver Tail, and three minutes later the signal station at Beaver Tail reported the fleet manœuvring northeast of Beaver Tail, and as having put out their lights; at 9.03 P. M. this signal station also reported the fleet coming nearer with their lights out, and at 9.30 P. M. Point Judith station announced the fleet under steam heading to the northeast and coming towards Newport.

The Fire Commander at Fort Adams, two or three minutes before 10 o'clock, while standing at the side of the observer of his station, heard him say (to himself, apparently): "There's a search-light to the left of Castle Hill." On looking through the glass the stacks of the *Brooklyn* were plainly visible, and immediately after her search-light was turned up the Bay. The alarm was sounded, and immediately after a report came from Fort Wetherill to the effect that the fleet is approaching, and the *Call to Arms* was heard at that post.

The arrival of the fleet at such comparatively short range, unannounced from the station at Price's Neck (where there was a search-light), or from Fort Greble or Fort Wetherill, was a surprise to the Fire Commander at Fort Adams, whose search-light covers only the water area inside of the channel to a range of about 3500 yards from the batteries, in mid-channel.

The fleet entered in the following order: *Brooklyn*, *Olympia*, *Kearsarge*, *Alabama* and *Massachusetts*; the *Montgomery* having sailed for New York, and the other ships to the Base.

Fort Greble could fire only as the ships became visible looking down Mackeral Cove from that post. Forts Adams and Wetherill were originally directed to take alternate vessels, but the *Brooklyn* was in sight from Battery Reilly (Fort Adams) for some time before the *Olympia* appeared, consequently she was taken under fire first by Battery Reilly. Probably for similar reasons Major Lundeen, commanding Fort Wetherill, fired on all the ships in turn, beginning at the head of the column.

At Fort Wetherill the *Brooklyn* was assigned as a target to the 12-inch guns at 9.59 P. M., and to the rapid-fire guns at 10.00 P. M., the opening range for the 12-inch guns being 4300 yards, for the 15-Pdrs. 4000 yards. At 10.08 P. M. she was put out of action by Fort Wetherill alone, the 12-inch guns having fired 8 shots, the 15.Pdrs. 34 shots, scoring in all 1885 points. Later, at 1600 yards range the 6-Pdrs. fired 20 shots at her.

Meanwhile, at Fort Adams, the *Brooklyn* had been assigned as a target to Battery Reilly at 10-05-30, to Battery Talbot at 10-09-00, and at 10-10-40 she was put out of action, Battery Reilly firing 6 shots (3 salvos) and scoring 571.8 points, Battery Talbot firing 10 shots from the 4.72-inch guns and 4 from the 6-Pdrs., scoring 253.0 points, or a total of 824.8 points.

Fort Greble scored (by mortars and 10-inch guns) 480 points on the *Brooklyn* as she passed Mackeral Cove—one salvo (at 10.06 and 10.07 P. M.) from each battery, at about 6000 yards range.

At Fort Wetherill the *Olympia* was assigned as a target at 10.08 P. M., the 12-inch guns firing 4 rounds at about 2500 yards, the 15-Pdrs. 10 shots at 2400 yards, by 10-13-30 P. M., when she was declared out: score, 1100 points.

Meanwhile, at Fort Adams, the *Olympia* had been assigned as a target to Battery Greene (mortars) at 10-08-00, but the range was within 3000 yards. One battery salvo was fired from the D. P. F. At 10-12-00 the *Olympia* was assigned to Battery Reilly and at 10-13-00 to Battery Talbot. Battery Reilly fired 3 shots, the 4.72-inch guns fired 18, the 6-Pdrs. fired 24, and the 3.2-inch field piece fired 8 shots. Not counting the mortar fire, the *Olympia* was put out by Fort Adams alone at 10-14-40, a total of 673 points having been scored against her up to that time.

Counting the mortar fire at 1955 yards at one-fourth its value at 3000 yards (and it would seem that its fire would have *some* value even at near 2000 yards) then the *Olympia* was put out at 10-13-10, the score, due to one battery salvo (at quarter value) from the mortars and 3 shots from 10-inch B. L. R., being 455 points.

The *fleet did not open fire* until after Forts Adams and Wetherill had completed their firing on these two leading vessels.

At Fort Adams the *Kearsarge* was assigned to Battery Greene (mortars) at 10-11-00, and one battery salvo (16 shots) was fired. At 10-14-00 she was assigned to Battery Talbot, the 4.72-inch guns firing 26, the 6-Pdrs. 13, and the 3.2-inch field piece 8 shots by 10-17-00, when she was declared out, the total score on her being 2388 points, counting the mortar fire at quarter value, or 2148 points without considering the mortar fire. These points should all count in putting this ship out, because in the meantime the heavy guns at Fort Wetherill were firing on her.

At the latter post the *Kearsarge* was assigned as a target at 10.14 P. M., and declared out by Fort Wetherill alone at 10-18-

20, the 12-inch guns have fired 2 shots, the 15-Pdrs. 36 shots, and the 6-Pdrs. 30 shots, the total score being 1640 points.

The 10-inch and mortar batteries at Fort Greble fired each a salvo on the *Kearsarge* at 10.08 P. M., at about 6000 yards range, as she passed Mackeral Cove, scoring 520 points.

At 10-16-20 the *Alabama* was assigned to Battery Reilly, Fort Adams, and at 10-17-00 to Battery Talbot, the former firing 6 shots, the latter 19 shots from the 4.72-inch guns, 12 from the 6-Pdrs., and 8 from the 3.2-inch field piece by 10-20-30, when she was declared out, the total score being 2197.2 points.

Meanwhile Fort Wetherill assigned this ship as a target at 10-18-30, and put it out at 10.24, firing 4 shots from the 12-inch guns at about 1000 yards range, 18 from the 15-Pdrs. and 28 from the 6-Pdrs., scoring in all 2360 points.

The Massachusetts had been assigned as a target at Fort Wetherill at 10-18-20 and one shot from the 12-inch guns and 16 from the 15-Pdrs. were fired at her at about 1000 yards, scoring 700 points.

At Fort Adams the *Massachusetts* was assigned as a target to Battery Greene (mortars) at 10-18-00, to Battery Reilly (10-inch guns) and Battery Talbot (R. F.) at 10-20-00, and at 10-24-30 she was put out, the mortars firing one battery salvo at a range of about 2000 yards, the 10-inch guns 6 shots, the 4.72-inch R. F. 12 shots, and the 3.2-inch field piece 7 shots, scoring in all 2124 points, counting the mortar fire at quarter value, or 1884 points without the mortar fire.

Taking the batteries of all three forts together these ships were each put out at earlier times than those specified.

The following would probably be a fair statement of these times:

Brooklyn.	10-02-30	P. M.	(600	points	required.)
Olympia.	10-08-30	"	420	"	"
Kearsarge.	10-14-30	"	1200	"	"
Alabama.	10-18-30	"	1200	"	"
Massachusetts.	10-21-30	"	1200	"	"

The 10-inch guns should be credited with several shots which were not fired, due to manœuvre (and not *service*) conditions, namely the position of the gun, with its muzzle over the top of the parapet, required by orders.

The search-lights of the ships did not interfere at all with the working of the range-finders on either side of the channel, and were never placed for more than a moment at a time on any modern battery or position finder, but they generally rested for a long time, as each ship fired, on the old emplacement for 8-in. C. R. between the old fort and the modern emplace ment for rapid-fire guns (Battery Talbot).

The fleet passed around Gould Island and went to sea, returning to the Base and anchoring. The batteries at Fort Adams and Fort Greble fired on the vessels as they passed out (beginning at 11.30 P. M.) because it was not accurately known at the time whether or not each particular ship had received the requisite number of points to put her out of action. Fort Wetherill did not fire at this time because the search-light plant had broken down at 10.48 P. M., after the fleet had passed in. The fleet did not fire while passing out.

At Fort Adams the command *Cease Firing* was given at 11-46-10 P. M. The 6-Pdrs. at this post were out of commission at 10.57 P. M.; of the same calibre pieces at Fort Wetherill, one was put out of commission (trigger broken) at 10-15-20.

The fleet, in its attempt to run the batteries, had a speed of about 12 knots. Of course, such a speed would not be adopted in case there was any fear of torpedoes, and the Admiral commanding relied on the information from the *Peoria*, to the effect that she had countermined all the mines in the Eastern Passage. But it must be remembered that the *Peoria* had been put out of action by Fort Greble before she entered the Eastern Passage, and the speed of the column should be reduced accordingly.

The manœuvres were completed at noon, September 6th.

COMMENTS.

Before proceeding to a consideration of the deductions to be drawn and the lessons learned from the manœuvres, a glance at the conditions on the two sides of the contest, the Navy and the Army, will assist in reaching juster conclusions.

In the first place, the Navy has had the benefit of practical experience in an actual war, which gave them not only two glorious victories against the enemy's fleets, but also real practice at the very work that came into play in the manœuvres,

and most of the officers of the manœuvre fleet took part in that war. The Coast Artillery, on the other hand, although it had the experience of preparing for that war, did not come into play in actual conflict.

Again, the Navy, with such ships as are in commission at any one time, is practically always on a war footing, the Coast Artillery, for various reasons, is not on a war footing at any time (even in war), and has not been at any one post, so far as I know, for the past thirty years.

The Coast Artillery, in these manœuvres, was, moreover, tested in a far more severe way than it would be in an actual war, because no foreign navy can be as familiar with our coast, in all its details, and with the forts that guard it, as our own Navy. The Coast Artillery was more than pleased to be so severely tested, at the same time it is only fair to them and to the country to make this plain and clear. The Navy officers, from their service alone, become familiar with our coast, but more than this, they have a special interest in our forts, since the latter guard the possible bases of the fleet in a future war, and these are therefore subjects of study with them. The Race, in particular, has been such a subject ever since General H. L. Abbot, of the Engineers, first presented the present scheme of fortifications. Narragansett Bay has also been made a study, partly because of its intrinsic value, and partly because so many naval officers have been stationed there on duty, either on ships, or at the Torpedo or Training Stations. Finally, the Navy has its War College, also in Narragansett Bay, where all such questions as arose in the manœuvres have been fully discussed by class after class.

The Coast Artillery, on the contrary, has little familiarity with ships or naval tactics, and is without a War College, an institution so necessary to develop study of a high order. Moreover, there were incidental difficulties which handicapped the Coast Artillery; some of the forts (Rodman, Wetherill, Mansfield and Michie) concerned in the manœuvres, had never before been garrisoned, so that the officers were entirely unfamiliar with the geography and the material; and on many of the guns and carriages the Ordnance Department was at work making improvements and repairs up to the very day the manœuvres began.

Organization.—The most important lessons taught by the manœuvres relate to organization.

The coast, in the present peace system of organization, is divided into a number of artillery districts, each under a field officer of artillery, a district comprising the forts of the harbor or harbors of the district which are *tactically* related.

Now, two or more districts are generally *strategically* related, like the districts here concerned, New London and Narragansett, as was proven by the manœuvres themselves. It is a principle of organization that rank should always correspond to importance and responsibility of command. The military office of lowest rank requiring *strategy* in its proper execution is that of brigadier-general, and there should be such an officer in time of peace, as well as war for the command of any two or more districts strategically related. In the manœuvres the Department Commander took command in person, but he would not be available in time of war, when the enemy might fall on any regions in his department. The manœuvres themselves have shown that such an officer is necessary.

The title of this officer should be *Artillery Brigade Commander*, not Fortress Commander (as the Drill Regulations for Coast Artillery have it), because this latter term is meaningless.

The District Commander should not also be a post commander, for if he is, then all his time is taken up by ordinary post affairs and duties, and he cannot devote himself properly to the military study of the needs of his district, or the tactical problems of defense. His station in action should also be separated from any Fort or Fire Commander's station, because otherwise he will have great difficulty in avoiding taking command of the Fort or Fire Command in his immediate vicinity, to the detriment of the District. Moreover, such combined stations are unnecessarily complicated for either commander.

The Fire Commander, in time of war, requires a relief. This fact was emphasized in both districts during the manœuvres. It is not sufficient to have another officer there, this officer must be of equal rank and experience with the Fire Commander himself, and be able to act in his stead fully and completely. It is impossible for one man to be on duty constantly day and night, without being worn out in a very few days, and no one

can tell whether the decisive action will come in his tour or in that of his temporary relief, therefore the latter must be a relief in every sense. Consequently, our organization should provide for at least two Majors for every Fire Command.

The Fire Commander must also have at least three assistants: a Range Officer, to take charge of the range-finding detail and all its work, an Adjutant, to take charge of the telephone men, and all messages and records, and a Search-Light Officer, to take charge of the search-light and its detail, and to see that it is manipulated as directed.

Every Depression Position Finder should be supplemented by a horizontal-base system of range-finding, not only because the vertical-base range-finder is liable to be put out of action by the enemy, or get out of order or be inaccurate or inadequate for various reasons, but also because the horizontal-base system is more accurate and may more fully utilize the field of fire.

Instruction and Training.—The next subject in which important lessons were learned is that of Instruction and Training. One of the greatest needs of the service is the instruction of Coast Artillery officers in the construction and identification of warships. The proper concentration or distribution of fire depends on the identification of the targets, especially by the Fire Commander, and in this the Coast Artillery is very weak. It is not a question of identifying a warship in a half hour or so, but in two or three seconds, when targets are to be changed, particularly in case of a run past or a forcing of the entrance to a harbor. Foreign authorities go so far as to say that a naval officer is absolutely essential in every shore observation station.

Battery commanders, for most efficient work, must also be familiar with the construction and the details of armor protection of every important warship of the enemy.

The accuracy of fire of our mortars and heavy coast guns depends on the accuracy of the Depression Position Finder adopted, and the accuracy of the latter (assuming correct construction) depends entirely on the accuracy with which the *water-line* of the target (the warship) is read. In our various range-finder stations the Observer Sergeant is the person directly responsible for this correct reading, and on him the accuracy of fire depends. At present this is only an ordinary sergeant of

a company, with only sergeants' pay. Considering his responsibility and the delicacy of the work required of him he should receive the pay of an expert surveyor, or at least as much as the best paid sergeant in the service.

The necessity for the more careful training of telephone men became at once apparent in the manœuvres. Very few men, without the most careful training, will transmit an order over a telephone exactly as it is given to them, and some men simply cannot do it. The telautograph men also require special training, as well as the men who manipulate the search-light. The latter must be handled with great care to be effective, and any spasmodic use of it will simply aid the enemy. The search-light should be given a constant, steady, slow motion in order to pick up objects, and should never be flashed around in a haphazard way, nor should it remain at rest. In the last position it is liable to open a way for the enemy to approach unseen along the dark ray bordering the light cone, as was long ago exemplified in the British manœuvres, especially those at Gibraltar.

Service of Security and Information.—For the unfortified coast regions between fortified harbors a Coast Guard Corps (which should be under the control of the Artillery Brigade Commander) is essential, organized like outposts, with pickets, supports, and a central reserve. The fortified harbors must have a similar system, for which the Infantry garrison is utilized.

A fleet of torpedo boats (under the full control of the District Commander, although commanded by navy officers) should be assigned to every important harbor, while patrol boats are required outside the entrance, and despatch boats inside between the forts, particularly in land-locked harbors. The Naval Reserves or Militia could be utilized advantageously for this service, because they would necessarily be familiar with every nook and corner in the bays near their home stations.

The work of the Signal Corps was evident from the account of the operations in this District. Every important movement of the ships was promptly reported. The hour of sending the message was, however, oftener omitted, but it was probably the fault of the receiver that it was not noted in transmission to other points.

Horizontal-base stations, as was shown at Fort Adams during the manœuvres, may also furnish useful information.

Garrisons.—The necessary artillery garrison for any fort can be readily determined from the number of officers and men required at the various headquarters (brigade, district, post, etc.), stations (district, fort, fire and battery commanders), and emplacements. To provide two reliefs (as required by orders for the manœuvres) it may be stated, in general, that, with the present strength of Coast Artillery Company the following troops will be required:

For every 12-in.	B. L. R.	1½	Companies.
10-in.	B. L. R.	1	"
8-in.	B. L. R.	¼	"
12-in.	B. L. M.	⅔	"
6-in.	R. F. gun	¼	"
15-Pdrs.	R. F. "	½	"

Every post was therefore too scantily provided with troops. Fort Adams for example, should have had, in order to carry out the orders for two reliefs, 13 companies of Coast Artillery to give two reliefs. There were but 6 companies there, and the result was that no mortar pit had *one* complete relief, not to speak of two. There were three companies of Massachusetts Heavy Artillery, but they were required to protect the horizontal-base stations and the reservation against landing parties. So it was at Fort Greble and other posts.

The required infantry garrisons must be estimated according to the principles of infantry tactics. In the case of coast fortifications there is usually no great danger of serious attacks on the land side, until after the attacking fleet can convoy a fleet of transports for that purpose, since the force that can be landed from the regular fleet is small. In these manœuvres, landings, except on military reservations, were ruled out, but signal, horizontal-base and observation stations could be captured, consequently some force had to be kept available to protect them.

Material.—The lessons learned in regard to material of all kinds were, of course, of the greatest importance.

Engineer.—Foremost among the different classes of material stands that of the Engineers, comprising more particularly emplacements, position finder stations and search-lights.

The lessons regarding emplacements were, no doubt, taken to heart by the Engineer officers present.

The position of the vertical-base position finders is a most serious question. None of the high power guns or mortars in this district can properly utilize their sectors of fire, for the simple want of a properly located vertical-base or horizontal-base range-finder. This is an enormous waste of energy, which should be remedied at the earliest moment. Prospect Hill on Conanicut Island will afford good stations for some and Richard Hill (near Fort Wetherill) for others, but there should also be horizontal-base systems supplementing these, otherwise there will still be areas left uncovered. Since vertical-base position finders must be exposed to be high enough for use, they must be protected, consequently armored structures, surrounded by concrete and earth mounds, like those used in Europe, must be erected.

In places where the 3000-yard circle from mortars does not fall on shore, flat-trajectory guns must be placed to cover the dead angle.

The small number of rapid-fire guns in all our forts is another very serious defect, and their absence was keenly felt during the manœuvres. According to the principle laid down by the best authorities for the past fifteen years, the number of these guns should be about half the number a fleet can bring to bear on the fort. Taking the fleet that entered the Eastern Passage on the night of September 5th as an example of what could be done in war, the number of rapid-fire guns required on both sides (Forts Adams and Wetherill) is:

Nine 6-in. Q. F., eighteen 5-in. R. F., and 41 6-Pdrs. But since it is usual to estimate *ten* ships to the mile in bombardment (there were but five in the 2 mile column in the manœuvres) double the above number of rapid-fire guns should be on *each* side.

Assuming the points allowed in the Rules for the manœuvres to be correct, the fleet that entered on September 5th (largely on account of its rapid-fire guns) could have put out of action all the defenses (except the mortars) on both sides in less than three minutes. More rapid-fire guns on shore would have prevented any such action.

The one great lesson taught by the search-lights was that they were generally too small. Except in restricted areas, no search-lights smaller than 60-inch projectors should be in use by the Coast Artillery. In this District, for example, it was found that the 24-inch light at Price's Neck could not illumine the water area as far as the lightship.

There were no mines laid in this District, but obstructions were placed in Buzzard's Bay, at the entrance to Fort Rodman.

Ordnance.—The ordnance material functioned well as a rule, most of the defects (like the poor primers of the mortars and other pieces, and the sticking of the breech-blocks of the 10-inch guns) being due to manœuvre, and not to service conditions. The breaking down of the 6-Pdrs. at Fort Adams and the 6-Pdrs. at Fort Wetherill was a comparatively small matter, since the 6-Pdrs. at Fort Adams were repaired by the company mechanic in four hours, but these troubles suggest the necessity for an Ordnance Repair Shop at every post; this is undoubtedly essential.

Signal.—The Signal material, although often out of order, was generally efficient. The telephones and telautographs never failed us at the critical moment. The former were the more generally used, because the latter had been installed so late that we had too short a time to get accustomed to them. The telephones for the horizontal-base stations at Castle Hill, Brenton's Point and Price's Neck, gave the greatest trouble, because they were necessarily more exposed to the weather, all these stations being merely improvised for the occasion. Nevertheless, they were always in working order in an emergency, the old ones being replaced promptly by new ones when they got out of order.

Rules for Army and Navy Manœuvres.—The rules devised for the manœuvres were remarkably good, considering the short time available for their preparation, and the want of data so far as the coast defenses are concerned.

But, there are two points that need correction.

In the first place, the manœuvres should either be considered as a whole, as a single campaign by a single fleet, or the *phases* of action should be clearly indicated. It was evidently understood by the Coast Artillery that a ship put out of action in one

engagement was no longer available in another, but it turned out that the Navy considered each action as a separate affair.

In the next place, the figures representing the value of a gun ashore or aboard ship, or those representing the value of ships, must be greatly increased, especially the first, and particularly those on disappearing carriages.

The fleet that entered the Eastern Passage of Narragansett Bay could, according to the figures of the *Rules*, have put out of action every gun on both sides (except the mortars) in less than three minutes. History shows the absurdity of such a result, since no fleet has ever put out of action an emplacement that was truly modern at the time of the action. The ease with which forts can put ships out of action is probably also much exaggerated in the *Rules*.

CLOSING REMARKS.

The value of the manœuvres to those who participated cannot be estimated, and the experience will react for years to come. The tests of personnel and material were probably far more severe than they would be in an actual war, but not only that, the officers and men of the two districts concerned saw more active service in these manœuvres than the average officer or man of all our coast defenses taken together would see in a war, because the attacks would probably fall on but a few points, and many of the forts would never see a hostile ship, or hear a gun fired.

Wars are of short duration in this highly civilized age, and the Coast Artillery, like the Navy, must be *prepared* when the critical time comes, because, after years of application and study, they may be given but a few moments, or at most hours, in which to prove their efficiency in actual conflict. The test of manœuvres is the preparatory test for war.

The country may rest satisfied with its Coast Artillery as well as with its Navy. Defects have been shown, and the lessons learned will be applied in our first line of defense, the Navy, for offensive operations elsewhere, as well as in our Coast Defenses from Maine to Texas, along the Pacific, and in our Island Possessions. But our strength has also been shown in both services, and the record of the manœuvres shows that,

while not perfect, we are nevertheless efficient, in our Coast Defenses as well as in our Navy.

II.

A LESSON IN PREPARATION.

By Captain LeROY S. LYON, Artillery Corps.

The "Special Idea" of the Army and Navy Manœuvres, 1902, as stated in the Rules, was "to test the training of the personnel and the efficiency of the matériel." The period of the manœuvres was at first divided into two distinct phases, (a) The Period of Preparation, (b) The Period of Hostility. The original division of time was two days and two nights for Preparation; six days and six nights for Hostility. The latter period was retained. The former was subsequently regarded as indefinite as a matter of necessity, the Army having begun its preparations about June 1st, 1902, and worked continuously up to the period of hostility commencing at midnight, August 31st. Therefore the actual period of preparation for the Army was three months. It is assumed that the Navy is ready at any time for the work laid out for it.

The "Special Idea" includes two sub heads only—(1) the training of the personnel, (2) the efficiency of the matériel. It does not contemplate a consideration of the conditions of personnel and matériel on or about June 1st, 1902. The manœuvres therefore had a value in addition to that of the General Tactical Problem and Special Idea, viz.: that of exhibiting the state of our preparedness or unpreparedness to resist a sudden actual attack by a foreign fleet before the special manœuvre preparations were undertaken. The state of unpreparedness is considered in the "General Idea" which reads as follows: "Anticipating the declaration of hostilities, a strong enemy's fleet (without torpedo boats) determines to make a sudden dash upon Newport, or the eastern entrance of Long Island Sound, to secure a naval base, taking advantage of the absence of a declaration of war to find the land forces somewhat unprepared."

Let us suppose that war had been suddenly declared between Germany and the United States about June 1st, 1902. Both countries would have commenced preparations at once. Germany's battle fleet would have reached our coast in less than

two weeks, and her transports would have followed with the army and been ready for combined naval and land operations about July 1st. In other words, actual war with an energetic European power like Germany would have given us not more than a two weeks period of preparation to resist a naval attack, and a four weeks period to resist a combined naval and land attack. For the simulated war with our own navy there was required three months of energetic work by all the staff and supply departments, and by about one-fourth of the total strength of the sea-coast artillery, to equip with the necessary matériel and to train the personnel absolutely demanded for a partial defense of the eastern entrance of Long Island Sound alone. The eastern entrance of Long Island Sound includes a very small fraction of the total number of fortifications on the Atlantic, Gulf, and Pacific coasts. The actual efficiency of the matériel and personnel of the two involved districts, after three months of hard work and when manned by one-fourth of the personnel of the entire sea-coast artillery of the United States, is a matter of vital importance not only to the artillery and to the navy, but to the country at large. The actual efficiency as measured by the "hit per gun per minute" formula prescribed for target practice was not altogether satisfactory to artillery officers. That it would have been much less satisfactory had it been required to bring all our sea-coast defenses to the same degree of preparedness in two weeks is self-evident. The conditions would have been about as they were during the late Spanish-American War, and the result, if the attack had been by Germany, might have been serious for the point attacked, supposing our navy engaged elsewhere. The Narragansett and New London Districts afforded, on June 1st, 1902, a fair average of conditions as they exist to-day along our entire sea-board. The manœuvres have emphasized this condition of affairs, not only for the supply departments and the artillery, but for that very small portion of the public which has the time and inclination to follow the development of their country's defense. When war threatens, this very minute portion of our great mass of people grows, as it grew during the Civil and recent Spanish-American Wars, to the proportions of a vast, timorous, stampeded crowd of citizens, clamoring for guns and men to defend their property and habi-

tations along shore. If, then, the question of defense has been or can be brought before this public in time of peace, by yearly manœuvres, such operations will teach a valuable lesson to the people and to their representatives in Congress,—a lesson that may result in the completion of the plans for sea-coast defense so strenuously urged by the War and Navy Departments during the last twenty years.

Throughout the entire history of this country there has been but one obstacle to an efficient defense of its sea-coast, viz. : the indifference and ignorance of the public whose property fortifications are to defend. With our vast resources,—money, steel plants, machine shops, and the ingenuity and skill for which the American people are noted, it has become only a question of the wish of the people to put our principal harbors and sea-coast cities into a state of defense that will for years to come prevent even a consideration of attack upon them by any foreign fleet. This preparation can be completed in four years instead of dragging out to twenty, if Congress wishes it. The plans and the skill are awaiting Congressional enactments and appropriations. Yearly manœuvres will help to bring these facts before the public, will add equipment to the Artillery districts, and teach valuable strategical, tactical, and technical lessons to the Army and Navy.

The value of the manœuvres to the Artillery has been very great. 1st.—As a school of practical instruction for about one fourth of its total strength. That this method of imparting instruction in technical matters is superior to that necessarily used in service schools is evident. It is quicker—(one month instead of a year) ; it instructs more students (one fourth of the total enlisted and commissioned strength instead of about one-twentieth of the commissioned strength only) ; the kind of instruction imparted is more valuable, since it all relates (when preceded by target practice as in the recent manœuvres) to the primary artillery function—that of "hitting,"—a matter that for lack of money and material has been too much ignored in the curriculum of our service school, for less important, though valuable courses of instruction. 2d.—To the recent volunteer appointees, the manœuvres were a practical illustration of the requirements of modern artillery. Many rules of discipline,

command and administration were given practical expression during the combined operations—rules which before were vague and unsatisfactory. In technical training these officers had an opportunity to use the methods and instruments prescribed for Fire Direction and Fire Control under circumstances which cannot be duplicated by the routine drills at small posts. These officers were called upon to construct plotting boards, orient guns, adjust range-finders, repair and maintain electrical communications, operate search-lights, etc. With this experience in practical work—and it was even more arduous than actual service—they are much better prepared to undertake the course of theoretical instruction at the artillery school. They have learned to some extent what to avoid and what to develop in order to attain the maximum artillery efficiency in the minimum period of preparation. 3d.—The manœuvres gave the Artillery an opportunity to test the material furnished by the Supply Departments, and to test their own systems, methods, and theories of fire direction and control. The confidential reports of individual officers would form a volume of considerable interest. In this paper only a few of the matters noted during target practice and manœuvres, and those only in a general way, can be referred to.

Mortars.—Our scheme of coast defense contemplates the use of a large number of 12-inch B.L. mortars—the proportion being over one-half of the total number of pieces of calibres above 6 inch. In the two manœuvre districts there are mounted forty mortars and twenty-one guns of large calibre, the proportion therefore being about double that of the average ratio contemplated. Now if the manœuvres accentuated any one omission more than another, it was the total lack of any practical system for firing these mortars. Of course the mortars could have been fired, occasionally, by using Ingalls' Tables or the Graphic Tables issued by the Ordnance Department. But *occasionally* will hardly do when the target is coming in at the rate of, say, 18 miles per hour. Mortars are effective at all ranges from 12,500 to 2500 yards, or over a range zone 10,000 yards wide. A battle-ship crossing this zone at a rate of 18 miles per hour, on a radius of which the battery is the centre, would therefore be under fire for about nineteen minutes only. For-

tunately, but barely in time for the best results, the Report of the Tests of Mortar Fire in Portland Harbor were made available. A board of artillery officers was at once directed to devise, at the earliest practicable moment, a practical system for utilizing the valuable results reported by the Portland Board. The system required a hurried study of ballistic tables, the selection of suitable zones, zone overlaps, the corresponding charges of two different kinds of powder, and the manufacture, by artillery officers, in camp and garrison, of range scales out of such material as was on hand or could be purchased by the individual officer. The general result was an unexpected rapidity of fire, reaching in one case a rate of one salvo every two minutes and ten seconds, including all the operations of range and position finding, loading, laying, and firing. It is thought that this rate can be reduced to two minutes. Previous to the manœuvre target practice a four minute rate of fire was considered excellent. In other words, we may regard the manœuvres as having doubled the efficiency of all the mortars in service. It is a precarious business, venturing guesses at what might have happened if so and so had not been done. But, without any fear of reasonable contradiction, I venture to say that had the four mortar batteries of the two manœuvre districts been suddenly called into action on June 1st, 1902, an enemy's ship coming in at the rate of 18 miles per hour would have made the passage unharmed so far as the mortar batteries were concerned. These mortar batteries constituted two-thirds of the total heavy armament of the two districts. The lesson taught should be remembered, and steps should be taken to embody in the Drill Regulations some provisional system for Mortar Fire to be modified and improved as subsequent firing and service target practice may suggest. Not only should a system be devised and prescribed in detail, but the necessary scales and plotting boards should be manufactured and kept on hand for issue when required. To detach artillery officers from their proper functions of command to devise and manufacture instruments at a crisis, like that simulated in the recent manœuvres, is as unnecessary as it is inadvisable.

Following the recommendations of the Preble Board, the improvised system of Mortar Fire Direction, used during the target

practice preceding the manœuvres, ignored all atmospheric conditions. The observed azimuth and range errors of each salvo were used for the corrections of the succeeding salvo. The advantages of this method are evident. It eliminates the anemometer, the wind-dial, barometer, ballistic boards, angle of approach, initial velocity variations and the resulting instrumental and personal errors. The two observed errors to be applied as corrections are the resultants of *all* perturbating causes, known and unknown. Moreover, these two corrections are applied graphically on the range scale itself, thus avoiding errors of addition and subtraction. In general terms the fire direction of mortars is reduced to the simplicity of field gun practice, so far as corrections are concerned, retaining the advantage of more accurate means of observation. For reasons given by the Preble Board, the observation method *must* be used for mortars. There is no choice. With guns of heavy calibre (8″ 10″ and 12″) the ballistic method is at present combined with observation. The use of the ballistic method complicates the system of gun fire by increasing the number of instruments, tables, personnel and communications necessary for its operation. The only reasons known for its retention in our system are, 1st, to increase the probability of hitting with the first shot ; 2d, the difficulty of identifying the shot splashes of any battery when several are concentrated on a single target. The first is a remote possibility rather than a probability and may be ignored. The second admits of serious consideration. It is at least possible that some system of Fire Control may be perfected which will make the observation method practicable for concentrated fire. Time of flight, the nature and number of shots per salvo, or a prescribed small interval between the shots of the same salvo, might assist the B. C. in identifying his shots. The B. C.'s of separated field batteries concentrating on a single target do effective work. With superior means of communication and better fire control, coast batteries should be able to concentrate without the complications of ballistic firing. Moreover, if a Fire Commander concentrates all his batteries simultaneously on the same target and of necessity depends solely on ballistic and atmospheric computations to reach the target, the practice will be blind and probably ineffective at long ranges. If he does not concentrate sim-

ultaneously but *successively*, the observation method can be used. At least it would seem advisable to test in actual practice the two radically different systems with a view to eliminating, as far as practicable, the complexities of the present ballistic method for guns, and making it conform to that now prescribed for mortars which form more than one-half of the adopted heavy armament.

The conclusions of the Preble Board have given a new interest to mortars as a means of sea-coast defense. A range of over seven miles was obtained with notable accuracy. The plot of a salvo of eight shots, range 12,500 yards, fired recently at Fort Terry showed all within a circle whose radius was only 50 yards. Nothing better can be asked of the piece itself nor of this particular lot of powder. Mortars, attacking the deck, are as effective against the most heavily armored battle-ship at 12,500 yards as at 2500 yards, whereas a 12-inch gun (M. V.= 2250 feet) does not become effective for the perforation of 13 inches of best Krupp armor until the target has approached to within 2500 yards of the muzzle of the gun. A mortar torpedo shell carrying 125 pounds of maximite or "Explosive D" is much more effective and much less expensive than a 12-inch armor piercing shot carrying 58 pounds. The question of relative effectiveness depends largely upon the nature and relative accuracy of the piece, and upon the probability of hitting by the system of Fire Direction employed. Before the Preble practice, many officers had considerable and reasonable doubts of the accuracy of mortar fire, especially against moving targets. That practice showed about 10 per cent. of hits against moving and 25 per cent. against fixed targets. Abroad, 18 per cent. of hits has been obtained, with howitzers, against moving targets. It is believed that 20 per cent. can be attained by our 12-inch B. L. M. With a rate of only two minutes for the delivery of salvos of eight mortars, a 20 per cent. hit average, the use of a large mine charge of "Maximite" or "Explosive D" in all mortar shells, and considering the more extended zone of effectiveness against battle-ships of the first class (from 12,500 yards to 2500 yards) it is believed that a battery of 8–12-inch B. L. M. is a more valuable means of defense than a battery of 2–12-inch B. L. R. If future practice against mov-

ing targets verifies this belief, the importance of perfecting a system of fire direction for mortars will need no advocates.

Guns.—The manœuvres afforded an excellent opportunity for comparing several systems of fire direction for guns, both original and modifications of the prescribed system. One of the most interesting of these was that used for the 10-inch Battery at Fort Adams, R. I. The advantages appeared to be: 1.—Omission of plotting board, 2—A reduced personnel for Fire Direction, 3—Speed of delivery of salvo. The rate was one minute, which included all the operations of prediction, transmission of data to the guns, loading, laying and firing. 4.—Silence and absence of confusion and excitement in the B. C. station. 5.—Short prediction, a most important consideration. 6.—The general result was liberation of the B. C. from all personal participation in Fire Direction, except the proper general supervision of his command, and availability for the reception of orders from his Fire Commander.

Among the several mechanical *devices for aiming and laying guns*, those used on the latest 6-inch disappearing model appeared to be the most satisfactory. They can and should be applied to the large calibre 8-inch, 10-inch and 12-inch disappearing guns. The gun can be kept continuously on the target by one man at the telescopic sight, another at the elevating wheel simultaneously giving the proper elevation, which should be expressed on an index plate, in yards, and *not* in degrees and minutes, as at present. Like the 6-inch, the larger calibres should be arranged for automatic electrical firing as they come into battery. By this system the maximum cover for Case II is obtained, the only exposed part of the entire matériel and personnel being the telescopic sight and the head of the man using it.

In general *the disappearing principle*, for rapid-fire guns, has not been altogether approved by artillerymen. It has been regarded as slow and the degree of protection as unnecessary. In the "Rules for the Army and Navy Manœuvres, 1902," 30 seconds was allowed as the approximate service rate of fire for both Army and Navy 6-inch guns. During the manœuvre target practice at Fort Terry a 6-inch disappearing gun fired aimed shots at a moving target at an average rate of 22 seconds. Some

of the intervals between splashes were as short as 14 seconds. About six seconds are wasted in coming into battery. Ordnance officers state that this interval of six seconds can be considerably reduced, if necessary, in a new model carriage. Even if not necessary, it would be an advantage to reduce it to a minimum. With this change the 6-inch disappearing gun seems to fill all the requirements of a rapid-fire gun for sea-coast artillery. It affords the best protection and concealment at least cost, being much superior in both respects to a barbette mount using an expensive shield, which is more effective as a splintering target for the enemy, than as a protection for its own gun and gun detachment. The best cover obtainable must be supplied for *all* sea-coast guns, since their number will always be less than the number that can be brought to oppose them. Suppose, for example, that it was attempted to supply *each* fortification on the Atlantic and Pacific Coasts with the number of rapid-fire guns that three or four battle-ships alone could bring into action. Congress would be appalled at the size of the appropriation necessary to accomplish this, and would never give it. Therefore better protection and concealment and an increased rapidity of fire is the proper solution of the problem. Shields seem inadvisable because they increase the size of the target aimed at, and break up into dangerous splinters when attacked by guns of greater power than those they are designed to protect. The disappearing principle gives the maximum concealment and protection at least cost for all calibres. Moreover, a principle that automatically, by the energy of recoil, returns the breech to the level of the loading platform for its ammunition, is superior to one which necessitates lifting ammunition to the level of the breech.

With a view to increasing the rate of fire of all disappearing guns and at the same time reducing the number of men required for their service, it is thought that a portion of the energy of recoil might be stored and used to close and open breech blocks, and that projectiles might be served from a plane above the breech and rammed home by the action of gravity instead of by hand power. Charges, which require more protection, must of course be stored on a lower level, but they could be served to the breech directly by a vertical hoist attached to and moving

with the carriage. The present system of ammunition service seems unnecessarily circuitous.

Range and Position Finding Systems.—The manœvres practically illustrated the group of causes influencing efficiency of fire. After target practice it was very generally concluded that the guns and mortars were accurate weapons, that is to say, that their manœuvres are small enough for the accuracy required; that smokeless powder can be so manufactured and packed as to give a fairly uniform velocity under service conditions and that in a comparatively short time the enlisted personnel can be satisfactorily trained by competent officers for the work required of them. This was all very gratifying. When it came, however, to the use of the D. P. F. system under service conditions, at medium and long ranges, and to the transmission of technical data from the B. C. station to the guns, considerable difficulty was experienced. The present depression instruments seem to be inadequate for long range work and inaccurate for medium ranges. At short ranges they might be used effectively, if needed, but it is at the short ranges that we least need instruments of any kind. It does seem unfortunate that with a mortar accurate and effective against the most powerful battle-ships at a range of over seven miles, our present D. P. F. is graduated to only 10,000 yards, and that from about 5000 to 10,000 yards it is so inaccurate under service conditions of installment and use, that the mortars become chance instruments rather than scientific weapons. A horizontal system must be devised, for mortars at least, and the identification of target by the secondary station worked on until it is worked out satisfactorily. A proposed method of finding, for the directing gun, and *without relocation*, the range and azimuth of the target, by entering a carefully prepared graphic table with the base end angles and thus avoiding the errors of plotting, seems to offer possibilities of speed and accuracy not heretofore obtained. One thing seems assured: that as long as the D. P. F. system is retained for low sites the efficiency of fire, under service conditions, will be reduced at least one-half at all ranges greater than 5000 yards.

One of the most unfortunate illustrations of the visibility and vulnerability of D. P. F. towers is the group of three at Fort ——, within a stone's throw of each other, about seventy feet

high, capped with plotting houses and absolutely unprotected from an attack coming from any point of the compass. These towers are the best landmarks on the coast. In them are placed the instruments of Fire Direction and Control and the trains of the personnel.

Communications.—The instruments used in connection with the Fire Direction and Control systems were the telephone, telautograph and megaphone. The telephone connected the F. C. with his B. C. stations. The telautograph transmitted technical data from the B. C. station to the guns. When it ceased to function, the telephone was used. When both telautograph and telephone failed, the megaphone was substituted where practicable. Previous to the period of preparation for the manœuvres there was not a telautograph in either of the two districts. No Fire Direction and Control telephones had been installed. Megaphones were scarce. It was not surprising that both telephones and telautographs went out of action from time to time. It is one of the most important lessons of the manœuvres that the scientific mechanical and electrical instruments required for sea-coast work cannot be hastily installed, and maintained and operated efficiently without thorough tests before being turned over to the artillery for actual service. For reasons just stated it would be unfair to criticize the telautograph until it has been tested under more favorable circumstances. But the use of either the telephone or megaphone for the transmission of technical data can be condemned without further trial. No instrument, electrical or mechanical, which depends on tongue and ear for the transmission and reception of technical data can be depended upon for uniformly accurate work. This statement was verified time after time, by both the telephone and megaphone, when substituted for the telautograph. The latter went out of action often enough to thoroughly test the failure of the telephone and megaphone when used during the excitement and hurry of rapid fire under service conditions. It may, I think, be concluded that a silent and visual means of transmission and reception of data must be used. The telautograph for these reasons, was superior to both telephone and megaphone. But it had an inconvenient way of going out of action at important crises. This may have been due, in part at least, to the attempt

to run the instrument on the light circuit. Being a constant voltage instrument it should have its own circuit and own battery maintained at a constant difference of potential to obtain the best results. The ink bottle and paper feed also seemed to give trouble, otherwise the instrument appeared not to be affected under service conditions of concussion, etc., and was certainly the best of the several means of communication observed.

From the artillery point of view, I think the two most important facts demonstrated by the manœuvres were, 1st, the need of a more accurate system of range-finding, 2d the necessity for a more reliable means for the transmission of the range and azimuth from the B. C. station to the batteries. Fire *control* can be entirely interrupted or ignored and an efficient fire still maintained, but similar conditions in fire *direction* are fatal. For if either the range-finding system or its communications from the B. C. station to the batteries be unreliable or interrupted the mortar battery must cease to function at all, and gun batteries are at once seriously crippled. These needs can be supplied by a successful horizontal-base system and by the substitution of a mechanical for the present electrical system of communication. The distance over which the mechanical system can be successfully used is short—perhaps 300 yards. All B. C. stations that can cover the field of fire from a point within the circle whose centre is at the battery and whose radius is 300 yards, should be located within such circle. When local conditions present such location the B. C. station must depend on the uncertainties of electrical transmission. The location of B. C. stations as near as possible to the guns whose fire they direct is at variance with the conclusions of the "Board of officers convened at Fort Wadsworth, etc.," whose report was published in the May-June, 1902, number of the *Artillery Journal*. Their report gives more prominence to the necessities of reliable communications between the F. C. station and his several B. C. stations than to those between the B. C. and his guns. The opposite view is here taken on the ground that fire *direction* is more important than fire *control* and because electrical transmission is, at the present time, too unreliable for communication of technical data and should be avoided where practicable. Another objection to the recommendation of the Board referred

to is the total separation of the B. C. from his command whenever, in the general case, his telautograph or telephone is interrupted. Technical data can no longer be transmitted; a mortar battery goes out of action, and a gun battery becomes inefficient. If located near the guns the B. C. station could still furnish data by megaphone and the B. C. could still exercise fire direction. Fire control is a luxury, fire direction an absolute necessity.

Search-Lights.—60-inch or even 72-inch lights should be used for all fields of fire, including maximum ranges. For narrow channels and mine fields 36-inch may be used. The number of lights should be large, several being occulted and held in readiness to replace those destroyed. The effort of ships discovered in the "run by," will be the destruction of search-lights and D. P. F. stations by rapid-fire guns. D. P. F. stations should be located as far as practicable from their search-lights. Protection of search-lights *in operation* is a problem for consideration. Destruction of all shore lights would mean the success of the "run by."

Supplies.—The manœuvres emphasized the inconvenience of having no standard plotting board. A plotting board should be as much a permanent part of the D. P. F. station as the D. P. F. instrument itself. Not only was this not true, but plotting boards could not be purchased or supplied by the Ordnance Department. The Atlantic Coast fortifications were stripped of their plotting boards and D. P. F. instruments to supply the two manœuvre districts, and even then the supply of boards was not sufficient. Additional boards had to be made by artillery officers in camp and garrison. It is unnecessary to say that the supply of Range Finders could not be so supplemented.

It required over two months to secure and equip the two manœuvre districts with the cable necessary for telephones, telautographs and submarine lines. It would require at least six months to similarly equip *all* Artillery Districts. Meanwhile war could be declared and fought, and peace concluded.

The opinion is sometimes advanced that, with an unlimited supply of money and authority to use it, preparations for war can be made in time to prevent war. To such persons the opin-

ion must be a hope rather than an expectation. In case of a contest, in which the fleet always has the choice of objective, *all* sea-coast fortifications must be eqnally prepared. This enemy can place a fleet at our doors in two weeks and an army in thirty days. In the case of sea-coast artillery, money is necessary but not sufficient to prevent an attack. Time is equally important. In peace, time and money are abundant; in war, money alone is available.

THE TRAINING AND EQUIPMENT OF CAVALRY AND MOUNTED INFANTRY IN INDIA, AND THEIR RESPECTIVE ROLES IN WAR.

By Captain E. M. J. Molyneux. D. S. O., 12th Bengal Cavalry.

(*Journal U. S. Institution of India.*)

[EXTRACT]

THE subject before us may be conveniently considered under the following three heads:—

I.—A brief summary of what we wish our cavalry and mounted infanty to do in a great war.

II.—How we should equip them for the performance of their duties.

III.—How we should train them with a view to developing their utility to the utmost.

I—THE GENERAL RÔLE OF THE MOUNTED ARM.

I say "a great war" advisedly: the equipment and training likely to be most useful in a contest with a great European Power is not necessarily the best conceivable for use against ill-armed or undisciplined frontier tribes. We must, however, remember that no contest with frontier tribes is likely to prove a real danger to the empire, no matter how troublesome and costly in blood and treasure it may be; and troops trained to the highest point of efficiency with a view to a possible contest with a European enemy should be quite capable of holding their own against less formidable foes.

If the South African War were taken as a complete illustration of what is to happen in the fighting of the future, there would be much reason

in the view that our cavalry system is in want of the most revolutionary changes, and that the sooner we get rid of such encumbrances as swords and lances, the more likely we are to become efficient for war under modern conditions. That view is so extensively held and expressed amongst those whose opinions are entitled to every respect—even amongst those whose whole training has predisposed them in favour of the "arme blanche," that one is apt to be carried away into the belief that the shock tactics of cavalry can never again be expected to give results sufficient to justify the retention of any weapon but the rifle. I have heard my late brigadier in South Africa, Lord Dundonald, after a year of incessant fighting over every kind of ground, express that opinion as the result of his experiences, and there are many other cavalry officers of wide experience who have admitted that all their natural prejudices in favour of the traditional use of their arm have been dispelled by the magazine rifle. And amongst officers of other branches of the service, the same feeling is naturally stronger.

On the other hand, we find a certain number of authorities in favour of making no changes of importance in cavalry armaments or tactics, on the ground that South African conditions cannot be reproduced in Europe, and that no deductions of importance can be drawn from the late war, as the conditions were abnormal. The name of Lieutenant-Colonel Maude will occur to every one as an apologist for the cavalry on these lines. I confess that I have taken something of a prejudice against that word "abnormal," which, like charity, has been used to cover a multitude of sins. Were our guns unable to send their shells half the distance of the Creusot guns, no one is to say that there can be anything inferior about our guns, for the conditions were abnormal; were our infantry formations too dense, the conditions must be ridiculously abnormal, for they were handled according to modern "scientific" ideas. Were our cavalry over and over again utterly impotent against inferior numbers, nothing can be wrong with the cavalry training or handling, because it would be "abnormal" for other cavalries to refuse to meet our men in a contest in which our men's superior training would tell in our favour. I am inclined myself to believe that the most abnormal conditions consisted in the uncanny skill which the Boers showed in taking advantage of natural features. And even granting that the Boer method of fighting was abnormal, as judged by European ideas, we must remember that in a contest with a European power on the Afghan frontier, which so many statesmen regard as being the most likely of all contests between Indian troops and a European power, we should be fighting what is undoubtedly the greatest mounted infantry power in the world. And supposing that we went into such a contest with our cavalry very insufficiently trained in dismounted duties,—as I contend they are,—but at the same time trained to almost the highest attainable point in purely cavalry duties,—which we know to be the opinion of competent foreign critics in China,—in such an event, after the first few

shocks had clearly shown the enemy in what tactics our superiority lay, surely it is not inconceivable or even very unlikely that he would issue instructions to his 59 regiments of regular cavalry, as well to his Cossack troops (who are not and never could be capable of meeting our cavalry in any kind of shock action) that mounted action should be avoided, and that a cavalry attack, even in the open, should be met by magazine fire and a line of bayonets. And if we should then find out, too late, that we had neglected one very important side of cavalry training, would it be any excuse for our responsible statesmen and soldiers to explain that disaster had overtaken us only because the enemy had not "played the game," and his way of fighting was "abnormal?" We must not forget that the methods by which the Cossacks wore down the superb regular cavalry of Napoleon ninety years ago, are practically the methods which would be employed against us to-morrow.

What, then, might we have to ask our cavalry to do in such a war? Should we abandon all idea of any but a purely mounted infantry training? I think not—not because I think that they would often get a chance of mounted action, for I hold that nine days of their fighting out of ten would be decided by the rifle alone,—but because I think that when the chance for mounted action arrives, it will be a very great one, and one of which full advantage cannot be taken by men armed with firearms only. For the whole experience of warfare in all ages and with all weapons should teach us that for attacking men who are already panic-stricken and "on the run," a rush is always the most effective procedure, and that the most disciplined troops may be, and often have been, turned by such a well-timed charge into a helpless, terrified mob, not only valueless themselves at the moment for offensive purposes, but sweeping away formed bodies placed to support them. The Boer war is not devoid of such incidents, one example being the charge of the bushmen on a commando whom they had taken unawares in the open, and attacked at full gallop, killing or capturing almost the whole commando. For one such opportunity against the wily Boer we might expect to get certainly half a dozen against any European foe; nor would the full result in the case of either the Boer or the other be attained merely by dismounted fire; he must be "gone for." Again, when attacked at night, or when for any reason they could not give the time to dismount, mounted infantry must necessarily be placed at a hopeless disadvantage with cavalry; and yet who is to say they will never be so caught? When with Dundonald's brigade in Natal I often had to go out with a company of mounted infantry to take up a line of day outposts, starting usually an hour before dawn. Pushing out, in the dark, miles ahead of the night outposts, armed only with rifles, and unable to distinguish anything clearly, even fifty yards ahead, it often occurred to me that had the enemy possessed cavalry, at all, we should have been unable to carry out such a duty without almost the certainty of disaster if attacked. Too dark to see to shoot, even if we

could have dismounted before they rushed on us out of the darkness, hardly any could have got away; even given a start our slowest horses would have been overtaken by their fastest. And the enemy will take liberties with mounted infantry, who cannot rush them, which they would never dare take with men who could both shoot and charge. The numerous successful "charges" of Boers right on to our men in the later stages of the war—as in the disaster to Major Gough's force, and the attack on Colonel Benson's column at Brakenlaagte—would probably never have been attempted in the face of mounted men who could use the cold steel.

I should be sorry to see cavalry made into mounted infantry only. They would lose a very great deal of their offensive power. But we can still less go back to the drill-book idea that the dismounted action of cavalry is temporary, to be sparingly used, and comparatively unimportant. It must always, in future wars of magnitude, be a leading feature in their employment. The enormously extended area of the contest in modern war implies that nothing is of more vital importance than the rapid transfer of fighting power to some threatened point,—to push home a success where the enemy is found unexpectedly weak, or to save some hard-pressed portion of our own forces from disaster,—for which purpose the cavalry may be quite possibly called upon to face the enemy's infantry. Such fighting power, in the case of any but an utterly demoralised enemy, must always mean fire action,—especially if he be acting on the defensive.

It may of course be urged that this is essentially the duty of the mounted infantry; unquestionably this view is correct, and given a reserve, partly cavalry and partly mounted infantry, held in hand with a view to some such eventuality, it would be correct to detach the mounted infantry for this purpose—if they were sufficient. In any war, however, in which two enterprising and well-matched opponents are engaged along a great extent of front, it may be regarded as certain that unexpected dislocations of even the most careful plans will occur. The mounted infantry may have gone off in one direction and an unexpected strain come in a quarter where only cavalry are immediately available; or it may be, as often occurred in South Africa, that when all the mounted men within hail had reached the spot, there were found to be none too many, and every available rifle was required to stave off disaster. In such circumstances it would be a very serious matter were the cavalry to be found inferior, when, acting as infantry pure and simple, either in training or armament, to any infantry, mounted or other, to whom they might be opposed.

Nor is it only in the comparatively exceptional cases where masses of cavalry act as masses of infantry that they must be no whit behind infantry in dismounted efficiency. Picquets, patrols, contact squadrons must expect to fight, using rifle fire alone, almost daily over a front of anything up to fifty miles. Nor is it easily possible to exaggerate the

importance of the results which may follow their proficiency, or the reverse, in purely infantry methods of fighting.

So we see that to get full value out of our cavalry soldier we must train him for the two classes of fighting which, according to the old cavalry superstition, can never be successfully combined; he must be what Mr. Kipling calls a "giddy hermaphrodite" when speaking of a force which somehow manages to combine unquestioned efficiency on land with the successful performance of most of the duties of an able seaman. The disrepute attaching in bygone days to the man who "fought indifferently on horseback and on foot"—to quote Dr. Johnson's famous phrase—was probably to a great extent justified. Armed with his cumbersome and inaccurate weapon, with which he could not be very certain of hitting at even a couple of hundred yards, he was of small value for infantry purposes and a deficient training caused him to fall between two stools. The value of the modern mounted infantry soldier, with his light, accurate, quick-firing and far-reaching weapon, is unquestioned; and the idea, that acting constantly dismounted must take the dash and go out of a mounted man, will find small favour with those of us who have had the privilege of serving with mounted infantry of the best type, such as Thorneycrofts or the Imperial Light Horse: nor have most cavalry reason to think themselves superior in these essential qualities to Sheridan's or Forrest's troopers. I am myself inclined to advocate armament with the bayonet for cavalry, with a view to stimulating the aggressive sentiment even when acting dismounted. I return to this question later. In any case I can see no advantages in the half-hearted system of arming a mounted man with a second rate weapon, not allowing him to become really efficient with it, denying him almost all opportunity of manœuvring on foot,—though he may be frequently required to leave his horse a couple of miles behind in action—and then complacently sending him forth to modern war, where, nine days out of ten, he will do his fighting as an infantry soldier. Hitherto a system of make-believe has prevailed with us. We have always instilled into our cavalry that their attack upon infantry, if dashingly carried out, is irresistible; and conversely have always assured the infantry that, provided they keep their heads and shoot straight, cavalry cannot hurt them Both statements cannot be true. The fact is, that neither is true. Both arms should have a just idea of their own limitations. It is instructive to recall to mind the deliberate opinion of the greatest master of what may be termed modern war—written in his exile at St. Helena—with all his matchless experience of successful war. The following marginal note was written by Napoleon to the contention by a military critic* that the best armament for cavalry would be a seven-foot lance, a four-foot sabre, and a pair of pistols:—

"A division of 6,000 troopers thus armed would be stopped by a house—a village—a ravine—held by a hundred light infantry. It is

* Memoirs of General Lloyd, Paris, 1784.

absurd—and cantonments—quarters—bivouacs—who is to look after them? Every horse-soldier should have a musket or a carbine."

And the "musket" of that day was a ridiculous blunderbuss, which could hardly be palmed off now as a "trade-gun" on a cannibal. What opinion would Napoleon have had of a policy which grudges the modern "horse-soldier" the right to do his fighting with the wonderful modern magazine rifle?

What broad distinction should we then make between our cavalry and mounted infantry? I take it that the difference in their rôles may be said to result from the inherent differences between the materials we have to work upon. The cavalryman should be—and is, in India—well mounted, and as finished a horseman as we can produce by years of instruction and liberal encouragement to all forms of mounted sports in which skill in horsemanship is the paramount requisite; and he is also most carefully trained in the duties of reconnaissance in the widest sense:—I do not mean the mere covering of a party or convoy on the march, which of course we expect our mounted infantry to do when required. The mounted infantryman, on the other hand, is not intended to be mounted on an animal of the speed and power of our cavalry horses; we find it hard enough in India to get a sufficiency of the proper stamp for cavalry remounts. He should be mounted on a stout, useful pony, without necessarily much pace or breeding about him, which can cover thirty or thirty-five miles in a day, mostly at a trot if required. Such an animal is not suited for reconnaissance where he might be pitted against the bigger and faster horse—of, say, a French or Russian dragoon. Nor would it be fair on the man to do so; his horsemanship cannot be carried to the same point as that of the cavalry soldier, unless we give him years of training in riding—which we are not prepared to do—and to train him also in the numerous detached duties of cavalry—which again is hardly feasible. Nor is it necessary, for we have really plenty of cavalry in India for purely cavalry work, if only they are properly supported by mounted infantry in work for which the latter should be equally valuable. Bodies of men on ponies which they can ride quite well enough to "get there" without giving their mounts sorebacks, to be used principally in masses in support of cavalry, but always intended to be sufficiently covered by cavalry to never run the risk of being attacked mounted—that is what we should aim at making our mounted infantry. Mounted infantry should be organized into corps, formed of volunteers of over three years' service from infantry regiments, but the latter should never be called on to deplete their ranks on the outbreak of war in order to create mounted infantry.

It may be objected that mounted infantry in South Africa did as much as the cavalry, and more, and carried out almost every duty that can fall to cavalry, more perfectly than the cavalry themselves; and the contention is, up to a certain point, a perfectly just one. Let us, however, examine the matter a little, and we shall see how much this was

due to any intrinsic superiority of mounted infantry compared with cavalry for such duties. In the first place, mounted infantry often got chances of distinction merely because cavalry were not available, and somebody had to do the work. Then, again, they had never to look to being opposed by cavalry; how that might have cramped their action is a point to which I have already alluded. And finally we have to consider the actual composition of the mounted infantry—an all-important factor, which has nothing to do with their training as cavalry. In the irregular corps raised at the beginning of the war, when men could be, and were, carefully picked—such corps as Thorneycroft's or the Imperial Light Horse—the material was of a kind possessing advantages which no soldiers from home, however highly trained, could possibly possess. In my squadron, for example, most of the men were either colonial born, or men who had spent anything from five to twenty years in South Africa, and "knew their way about" in a way not easily acquired by a novice on the veldt. Nearly all spoke either Dutch (the Taal) or Kaffir; the latter invaluable at all times in reconnaissance, and especially when Kaffir scouts were largely used. Many spoke both languages. Not only did they know the Dutchman's language, but a lifetime spent with him had taught them his ways and peculiarities, and they could always form a good idea of what he would do next; when they came to a house they knew what they would be likely to find there, and where they would find it: on reconnaissance, they knew where the Dutchman, if about, was sure to be lying up,—by what donga he would creep up to get round a patrol, and what were the certain signs of his recent presence in the vicinity. All could ride and most had kept horses. The general level of intelligence and education in the corps was higher than could possibly exist in any regular regiment: there was a considerable proportion of doctors, mining engineers, and other professional men in the ranks, and Rhodesia and other distant tracts had sent their quota of adventurous spirits—the "leaderless legion" who had learnt nothing of warfare from books, but whose knowledge of irregular warfare was long and wide, hunters and trappers accustomed to fight against cunning and merciless native tribes. I had also half a dozen American adventurers who had fought in Cuba, the Philippines, and South American revolutions—their training and methods instructive, though not ours.

Is it quite fair to blame the cavalry because they could not immediately produce results equal to such corps? The "man in the street" was very positive that mounted infantry must be a more useful arm than cavalry, because they played the more prominent rôle at one time. The thoughtful student of war will not jump to so hasty a conclusion. He will understand that to expect mounted infantry, possessing none of the superior advantages possessed by the South African irregulars, to show up to equal advantage, compared with cavalry, as was the case in Natal, would be utter folly. And we in India should not lose sight

of the grave dangers which we run if we put mounted infantry to work at which, if opposed to good cavalry, they must inevitably fail.

* * *

DE WET. BOTHA. DELARY.

SOME LESSONS OF THE SOUTH AFRICAN WAR.*

Translated by Lieut. Gordon Robinson, U. S. A.

II.

IN 1899, under the direction of Sir Mansfield Clark, now quartermaster general of the army, extensive manœuvres were held at the camp of instruction on Salisbury Plain. They preceded only by a few days the departure of many of the troops. Some generals of universally recognized reputation were present at these manœuvres.

It may be stated that the methods of combat were practically those in use by the majority of European armies, with a difference perhaps more accentuated in the cavalry and artillery. These had a tendency to operate in strong and consolidated groups. The cavalry manœuvred

*Gen. de Négrier in *Revue de Deux Mondes.*

in masses, and night attacks were favored. The regiments presented a very handsome appearance, and the material was of exceptional quality.

Some days afterward at Talana Hill, Oct. 20, 1899, their customary battle methods were subjected to the test of the battle field. General Symons employing four battalions of infantry, three batteries of artillery, a regiment of cavalry and a detachment of Natal police, in all about 4500 men, had established his camp to the west of and near the town of Dundee. At field-gun range to the northeast (about 4500 metres) were Talana Hill and Mt. Impati, and from these the town was separated by a rather deep ravine. Gen. Symons covered himself in the direction of the enemy by placing advanced posts on these heights. The movements of the Boers who proceeded from Natal had been known since the 14th. Glencoe had been evacuated on the 18th. However, on the nights of the 19th and 20th no special disposition had been made in view of the imminent arrival of the enemy.

The encampment of troops, thus covering nearly 5 kilometres, was thought to be secure. The fact that a line of advanced posts, although well placed, can always be surprised when it is attacked in its formation of security had failed of consideration. This is the reason that Marshal Bugeaud organized his system of ambuscades, which, by delaying the enemy, permitted the transformation of the line of advanced posts into a line of battle.

The advanced posts, attacked at half-past three in the morning, were naturally routed by General Lucas Meyer, with 3500 men and five rapid-fire field guns.

The Boers soon placed their artillery in position and opened fire on the camp at 4500 metres. The surprise was complete. When the shells burst among the tents, the men, just returned from their usual inspection, were occupied in preparing their breakfast. The troops displayed the greatest coolness under this cannonade. They equipped themselves, took their arms, and fell in ranks, while their artillery was soon formed in battery.

Does not this example prove the remarkable firmness of the troops at the beginning of the campaign? The termination of this affair completes the proof.

The action commenced and developed according to the regulation principles: an artillery duel between three batteries grouped on the right flank and the five Boer pieces, an attack by three battalions in the centre, while one battalion remained in reserve. The cavalry which was posted on the left was intended to act on the flank. After an hour and a half of cannonading, Gen. Symons advanced his three battalions to the attack. The second battalion of the Royal Dublin Fusiliers was in the lead. It formed a strong line of skirmishers, followed at 200 metres by the support, while still further behind was the reserve. The other two battalions (a battalion of the King's Royal Rifles and one of the Royal Irish Fusiliers) advanced in the same order and as steadily as did

the Dublin Fusiliers. The artillery promptly supported the infantry and advanced with it.

The troops bore themselves with remarkable bravery, and drove the enemy from the heights. But the first line was only a screen. The Boers had one of their manœuvre corps ready for a counter attack. General Symons was mortally wounded. Gen. Yule took command. Meanwhile the cavalry, mounted infantry, and the machine guns, under the orders of Lieut. Col. Maller, and which were to attack the right flank of the enemy, were surrounded by the Boer riflemen and captured, with the exception of two squadrons of the 18th Hussars. They, being to the rear, were enabled to rejoin the troops in retreat. Ten officers and 31 men were killed; 20 officers and 105 men were wounded; 9 officers and 21 men were taken prisoners or were missing. Such was the result. The losses of the Boers were only 10 killed and 20 wounded.

Oct. 30 brought a new experience. Gen. White, commanding at Ladysmith about 10,000 men, of whom 7,600 were excellent, well officered troops, and 36 field pieces, had before him about 14,000 Boers who were manœuvring to surround him. He decided to sweep Long Hill as a preliminary to opposing the investment. In order to cut off the retreat of the Boers, whom he expected to defeat, since he was able to attack with his reunited forces one of the three sections held by the enemy. Gen. White sent by night a large detachment accompanied by mounted troops beyond the heights of Nicholson's Nek, to attack the enemy in the rear. The engagement developed according to the rules. After a vigorous assault by the artillery, the infantry formed lines of skirmishers, supports and reserves and attacked; the cavalry turned a flank. The action, commenced at daybreak, ended about half-past eleven o'clock with the retreat of the troops upon Ladysmith. The Boers, moreover, were not disturbed. As for the detachment under Lieut. Col. Carleton, composed of two battalions of infantry, which had been sent around Nicholson's Nek to cut off the Boers' retreat, it was surrounded by the Boer riflemen and after a battle which lasted from daybreak till half-past twelve o'clock, it was forced to surrender unconditionally.

About that time, in explanation of these reverses, it was often repeated that the English were ignorant of the strength and armament of the Boers. In June, 1899, the Intelligence Division had published a pamphlet entitled "Military Notes on the Dutch Republics of South Africa." It contained most detailed information upon the organization, the forces and the armament of the republics. The number of fighting men mentioned was even remarkably near the truth—33,500 men, instead of 30,000. The tactics of the Boers were exactly described —in short, the government and the army were thoroughly informed about their adversary. Their valor, and power of resistance, however, had been under-estimated by the English.

Lord Wolseley said in the House of Lords on March 15, 1901: "I frankly admit that, in common with all who have expressed an opinion

on the subject, that I have under-estimated the individual military qualities of the Boers."

But no one was prepared to admit that the new magazine rifle, using smokeless powder and handled by cool men, had a power unsuspected until that time. Other reverses were needed to convince them. The same methods still led to the same defeats—for example, at Belmont on Nov. 23, at Ruslin, Nov. 25, and the Modder River, Nov. 29, where Lord Methuen's division marching to relieve the siege of Kimberley, frontal attacks were employed. The infantry was directed upon an objective in its front, assumed immobile formations and effected its own destruction.

The later disasters of Magersfontein, Stromberg and Colenso, were due to the same cause. The troops blindly hurled themselves upon the enemy without the least reconnaissance. They employed deep formations, and formed in successive masses that received every missile fired by the enemy. At Colenso (Dec. 16, 1899) in the attack from the west, the infantry brigade advanced to the attack in column of masses. The artillery opened fire at 4000 metres. The infantry advanced with one battalion deployed in the first line, and the three other battalions in reserve. The three companies of the leading brigade (Dublin Fusiliers) had each a platoon deployed as skirmishers, the other platoons were in the support.

Behind, followed the three other battalions, the Connaught Rangers, Inniskillings, and Borderers. The Boers fired a few shells and held their rifle fire in reserve. They permitted the English to advance up to about 1200 metres, then, altogether they opened fire. The Connaught Rangers had orders to deploy on the right of the Dublin Fusiliers. Naturally, under that violent fusilade, they were unable to support the Fusiliers, and were thrown into confusion with them. The Inniskillings, who were to have advanced on the right of the Connaught Rangers, were overwhelmed by the fire and compelled to remain in the rear. The Borderers could not advance at all. The battle, commenced at 40 minutes past five and was concluded in 10 hours. The troops were driven back, many could not even retire behind shelter, so they remained lying where they were, and at the end of the battle, surrendered.

In the centre the 2d and 6th brigades were disposed in the same manner. The 2d West Surrey battalion and the 2d Devonshires were in the first line. The other troops formed supports and reserves. The battle front was 900 metres long and its depth from 1500 to 2000 metres. This space was sown with compact groups, which, now visible and again hidden, attracted fire when they were in view.

These attacks advanced to within 900 metres of the Boers and were unable to go further. The artillery was advanced to support the infantry. Two batteries under Col. Long were posted at 900 or 1000 metres from the enemy. In a short time they were destroyed. Col. Long was

killed. The horses and cannoneers were picked off. Out of twelve pieces ten were abandoned. Of six companies sent to their rescue, four were forced to turn back; the two which advanced were compelled to find shelter with the retreating cannoneers. At the end of the day, not having been able to retire on account of the fusillade they surrendered. At 11 o'clock in the morning the right and the centre were in retreat, the left wing having commenced its retreat at 10 o'clock. The troops though they had suffered a great deal, executed the retreat in perfect order by echelons, as if on the manœuvring field; this only served to increase their losses. The Irish and Scots of Barton's brigade distinguished themselves. The English losses exceeded 1300 killed and 10 guns, the losses of the Boers being only about 30 men.

At Magersfontein on December 15, 1900, it was even worse. Lord Methuen wished to execute a night attack, using the élite of the English army, the guards and the Scottish troops, who this time showed their prowess.

The honor of attacking first was reserved for the celebrated Black Watch. It formed in column of companies deployed in line at intervals of six paces as on Salisbury Plain, and in this order it advanced to 800 metres from the Boers, where it crossed the wire entanglements which it encountered, without a change of formation. It was near daybreak, nevertheless it advanced about 200 metres more over uncovered ground, without taking any other formation, in order to cover the main body, as the regulations recommend. The Boer patrols had, however, discovered the attacking party and kept abreast of it in the advance. At 4.30 A. M., General Wauchope, who commanded the head of the advance, arrived with his troops at 400 metres from the enemy's line. He gives the order to deploy and attack, when, the movement barely commencing, a rifle shot from a nearby Boer patrol gives the signal and a hail of bullets meets the troops, striking them in front and obliquely. In a few seconds a fifth of the force strewed the ground. "Thanks to the rapidity of fire of rifles provided with cartridge clips," writes an English witness, "the withering fire continues without interruption." The survivors were thrown into disorder. The officers succumbed while trying to hold their ground. Gen. Wauchope was killed, the wreck of the brigade formed with difficulty in the rear. The affair had lasted six minutes, and out of 3600 men engaged, 600 fell.

The English artillery formed in battery and, covered by the wreck of the Scottish troops, prepared for a renewal of the attack by the Guards. At 7.30 the Guards entered the line with the Gordon Highlanders, who had originally been left with the convoy, and were summoned in great haste.

The artillery supported from near by the attack of the infantry. The regulation dispositions were, it is seen, exactly observed. After a violent preparation by the field artillery, assisted by some heavy naval guns firing lyddite shells, the Gordon Highlanders advanced to the

attack. They were decimated and driven back to their original position, where they remained the rest of the day, without being able either to advance or to retreat.

To the sound of the bagpipes the Scottish brigade was rallied in small groups and placed in advance of the artillery to cover it, but about 2 o'clock, the Boers, who had almost ceased their fire, suddenly resumed it, and drove them back. The few surviving officers sacrificed themselves to hold the ground; but about 5.30 the artillery of the Boers being put in action, the remnant of that unfortunate brigade was still further shattered; 971 officers and men were lost. The Boers lost scarcely 200.

From January 15 in the affairs on the Tugela heights, the English tactics began to be modified. Night time was utilized for the marches of approach. The troops reconnoitered at great distances. The artillery acted in echelons. The field pieces were advanced while the naval guns were opening fire.

Lord Methuen began to employ the method indicated by the Germans as a promising method of attack of the future. The troops being put in march at night, regulate their progress so as to arrive at daybreak before the enemy's position in formation for attack. The idea is to profit by the darkness to cross the zone of fire, and, when there is sufficient light, to begin the attack.

This is what was done on November 23, at Belmont. General Methuen executed a night march of approach of eight kilometres, then formed the seven battalions of his infantry in two lines of battalions in double column, each company being in line of battle of two ranks. The infantry is thus disposed for the decisive attack. The march is effected in perfect order and absolute silence. At four o'clock in the morning, day-break begins. The troops are no more than 300 metres from the enemy, still nothing appears. It seems as if the enemy has withdrawn, or that he is to be surprised. They arrive at 250 metres. Suddenly a fusillade bursts forth. A hail of bullets shatters these dense formations. But they are the best troops of the United Kingdom. In spite of their heavy losses and two repulsed assaults they reach the line of defense, only to find it unoccupied. Before them a new line is unmasked. Everything is to be done again. They repeat their arduous task; this second line is beaten. Behind it a third one appears. At 8 o'clock it, too, is taken. The Boers still fall back to occupy a position further on. No more can be done; the exhausted troops return to their camp at Belmont, and show for all their labor a loss of 26 officers and 296 men killed or wounded, and nothing accomplished. The loss of the Boers is only about 30 men.

On January 20, at Venters Spruit, the change in tactics becomes definite. Two battalions of the Woodgate brigade (1st battalion of the South Lancashires and the 2d battalion of Lancasters) advance wholly deployed

as skirmishers, while a mass of six battalions places itself in a dead angle, there to await the signal for the decisive attack.

At 11 o'clock, this signal is given. Profiting by preceding lessons, the battalions at the head, form in long thin lines and advance by rushes. They arrive at the plateau which forms a glacis of about 900 metres, and try to enter there. But there after considerable losses they are stranded. These do not know yet how to lead an attack.

Lord Roberts is about to illustrate another method. The evolution in tactics is achieved with the Orange Free State for its theatre. The army has been concentrated about the Modder River and manœuvres first against General Kronje. Its strength is 32,000 infantry with 11,000 cavalry or mounted infantry, 11 field batteries, 2 howitzer batteries, 8 naval guns and 3 *pom poms* equal to those of the Boers.

In order to understand what follows, a view of the region is necessary.

The section in which the operations take place is an immense plain, all parts of which are easy of access, and covered with the veldt grass which furnishes to all the live stock of the country, horses, cattle and sheep, their only though substantial nourishment. At places the mounds of 20 to 25 metres height, called *kopjes* arise, sometimes isolated, though oftener grouped like the islets of an archipelago. In this last case, their altitudes being uniform, they give from a distance the impression of a continuous plateau. But it is nothing of the kind. Ravines, gorges, even at the level of the plain form among themselves irregularities beyond which the plain continues to extend. These kopjes, then, are difficult of defense by troops who do not know how to manœuvre, for, their flanks not being supported, it is easy to outflank them. In order to avoid a renewal of the severe lessons received in preceding attacks, Lord Roberts decided to advance in numerous columns upon a well extended front. Then when one of them comes in contact with the adversary, it halts, and engages in an action. Those which encounter no resistance, move around the flanks of the enemy and force him either to retreat or be surrounded.

Thus General Kronje was attacked, then surrounded at Paardeberg Drift on Feb. 18th, 1900. He capitulated on the 27th with 38 officers and 4010 men, of which 151 were wounded. It may be remarked that five or six hundred women and children whom he had had the weakness to permit to join their husbands or their fathers had impeded his movements.

This battle of Paardeberg deserves some details. The Boers had established themselves in the bed of a river in order to have a flat and extended field of fire and the protection of the stream. The English Army commanded their camp. The battle commenced on the 18th at day-break by a surprise of the English mounted infantry of a bivouac near the ford and lasted until nightfall.

The sixth division (General Kelly-Kenny), and the ninth division (General Colville), were engaged. They executed a concentric march

in order to drive the Boers upon the ford. The artillery formed in battery at 2500 metres. About noon, thanks to a movement of the mounted infantry, the Boers were surrounded. Twenty thousand English enveloped upon the two river banks the 4500 men of Kronje. It seemed that the Boers were about to be crushed by this pressure.

The thirteenth brigade (Knox), and the third brigade of Highlanders attacked at one o'clock. Their two generals were wounded. They were not able to approach the river nearer than 1000 metres.

At half past two Knox's brigade, having on its right a battalion of the Yorks, and on its left 6 companies of Highlanders, renewed the attack. It advanced within 350 metres of the enemy, but was unable to go farther.

At four o'clock the 19th brigade, reinforced by the Cornwalls, advanced to a desperate attack with bayonets.

It was shattered at 400 metres. However, Canadians and Cornwalls were revitalized with energy. Under the fusillade which withered them, scarcely a man was left standing and all their officers had fallen. They were obliged to wait for nightfall before they were able to retreat, after having lost about 1200 men killed and wounded.

The next day, the 19th, a military attaché had rejoined Lord Kitchener near the artillery of the 5th division, which, reinforced by that of the 7th division and six naval guns, cannonaded the laager of Kronje at 2500 metres. The effect of this cannonading appeared to be overwhelming. There happened to be, near the batteries, the 18th brigade of infantry formed in line of masses. It was composed of the Buffs, Essex, Yorkshire and Welch. The men presented a superb appearance of training and of resolution. The redoubling of the cannonade seemed to indicate the preparation for the assault. The military attaché asked General Kitchener if he intended to attack. "There is something better to do," answered he, "if I had known yesterday what I know to-day, I would not have attacked the Boers in the bed of the river, for such an attack is bound to fail when made in the face of rifle fire."

This bloody affair of February 18th was the last in which the English had attempted to force a position by employing antique methods. In their movement from Paardeberg to Bloemfontein they employed new ones. They extended the width of their formations. The front often exceeded 20 kilometres. The only obstacles to this march in an order half deployed in lines of columns were the water courses. Until their arrival at Bloemfontein the troops found nothing but easily fordable streams flowing into the Modder. But thenceforward they had to cross large water courses, the Modder, Wett, Sand Walsch, Rhenoster and Vaal, all flowing toward the West perpendicular to the direction of the march. Then they were often compelled to fight.

Even when the passages were disputed, the army did not modify its marching formation. Each column was composed so as to have a numerical superiority over any force of the enemy that it might encoun-

ter. Those who, favored by the terrain, gained an advance over the others, attacked the rear of the enemy and thus assisted the progress of neighboring columns. With an adversary as little enterprising as the Boers were, it was advantageous to increase the number of columns. Always the subdivisions were such that each division was able to concentrate all its elements of combat in one hour.

The divisions marched by brigades placed side by side, often having between them intervals of 1000 to 1200 metres, in which were disposed the unbrigaded elements—artillery, engineers, ambulances, supply columns, divisionary convoys, etc.

The headquarters of the army followed the central line of march which was marked with the field telegraph cable unrolled and laid upon the ground by sections in the first line, who followed the cavalry or the mounted infantry.

In the infantry brigades the four battalions formed the four elements of a sort of very open double column with a space of 250 or 300 metres between battalions. In each battalion the eight companies, each formed in one rank, were placed from 100 to 120 metres behind one another. In each company the men were at intervals of 2 or 3 metres.

The troops being in this formation, even at the beginning of an engagement, did not have to pass from the order of march to the order of battle. It was sufficient to increase the distance between the different elements. This disposition of thinly scattered men, designated by the expression "awaiting shell," became eventually the formation preparatory for battle.

In the cavalry and mounted infantry the men, always in single line, but usually by sections or half-sections, rode at four or five yards' distance from each other. This interval, while diminishing the vulnerability of the group, allowed the horses to browse at their ease at every halt without losing time. The divisional groups of artillery marched with their three batteries in fighting order, each followed by their ammunition wagons.

* * *

The change in tactics is simply deduced from these dispositions. Following the development of the battle, from the first contact to the end of the engagement, one may readily point out the modifications which have been introduced.

From this time onward, the general in command depended very little upon information supplied by the cavalry and mounted infantry, beyond the limits of the actual conflict. The latter, who marched half a day's journey away from the main army, with the horse artillery and the flying batteries of pom-poms, were occupied in fighting rather than scouting. Their mobility enabled them to turn the flank of any opposition, if they could not at once crush it. In a word, they did the scouting by fighting on foot. Often the action of a few groups of them at great distances sufficed to clear the ground. If it did not, the arrival of larger

forces accomplished the same end: it gave a respite of 12 or 18 honrs, which the Boers frequently employed in beating a retreat. The classical programme of the introduction to a battle: contact of patrols, gradual engagement of the vanguard, etc., was never seen.

The defense was usually met with in the form of a line of marksmen, more or less sinuous, formed by groups of from 12 to 20 men, widely spaced out, and with intervals between the groups of sometimes as much as several hundred yards. The marksmen were absolutely invisible, and their presence was only revealed by the singing of the bullets as they passed. Neither the point from which the shots came nor their direction could be perceived. Even the report could not be heard. On the attacking side, along the whole front, bands of from 20 to 30 horsemen, placed at five or six yards distance, were scattered, as if independent of each other. At the sound of the bullets, these groups took what shelter they could and watched. Nothing could be known of the enemy unless their artillery opened fire, and often the Boers held it in reserve. Then came, just out of rifle range, a period of observation, waiting and groping, during which every one hoped for some favorable event to occur—at a point away from himself. Thus the opening of the action was often marked, not by redoubled energy on the part of the skirmishing sections, but by a pause. The invisibility of the enemy, the sense of the unknown, weighed on the spirits of every one. The English had a word for this special and depressing atmosphere; they called it the "war-cloud."

* * *

The English projectiles were comparatively ineffective. Said Lord Methuen: "Our shrapnel frighten the Boers, but do not kill them; the shells have not velocity enough."

Under cover of the artillery fire the cavalry and mounted infantry took up their positions for attack. Part was detailed for the front attack and dismounted, and the rest, still in the saddle, advanced on the flanks, up to the point at which, the defensive line being no longer occupied, it became possible to turn it and take it in rear.

The general features of the British attack are very clearly described by an eye-witness. I quote his account:—

In general, the duty of leading the front attack fell to the mounted infantry. They dismounted, behind shelter, at about 2,000 yards, left their horses and, forming lines of riflemen, set to work to gain ground. Advance was usually impossible within the zone of 800 yards, at which point the shooting became very exact, thanks to the absence of smoke and the bareness of the ground. It seemed as if at about 800 yards they came to a barrier which could not be crossed. The formation for crossing the space between the 2,000 and 800 yards ranges was a single line of men at intervals of three or four paces, without supports or reserves Every one was in line. There was thus no attempt to make any violent movement against the enemy at this part of the field. Reliance was placed on the action of the wings, the effect of artillery fire, and lastly on the arrival of the divisions. The object was to gain time, and more often than not nightfall stopped the front attack before it had got as far as the 800 yards zone.

Advance was alternated with firing, and was made from one shelter to

another. Open ground was avoided, not only for positions, but even for crossing. At the outset of the operations the officers gave the signal to move by example They took advantage of a slackening of the fire, and tried sometimes to preface the rush by a more active volley, which they interrupted by a whistle. But it was acknowledged that this plan could not always be adopted. Some men—always the same men—hesitated to follow their leaders.

Most of the officers then got into the habit of sending on the non-commissioned officers and the willing men to the next shelter, while they took care of the movement of the whole group. The contagion of example has always been a more effective device for getting men to advance than merely urging them from behind. The newcomers tended to take to the same shelter as their comrades.

The line of riflemen, straight to start with, quickly changed its form as it got over the ground. The shelters drew in everyone who came near them, and so regulated the spacing and the form of the fighting line. If one went over a battle-ground the next day, the different densities of the fighting line were indicated by the numbers of cartridge cases, empty or full, which marked it out. In the open plains not a case was to be found.

The retreating enemy were generally followed up only by a few shells fired at the wagons. The front line meanwhile advanced as the defenders retired, not stimulating the retreat by any definite attack.

This abstaining from pursuit, which has already been noticed in recent wars, was very marked, both in the English and the Boers, especially in the first year of the war. When the English retreated after the sanguinary checks of Magersfontein, Colenso, Spion Kop, etc., the Boers remained in their trenches, without attempting to convert retreat into disaster. It was the same on the English side; notably at Poplar Grove, where General French, who had turned the enemy's left flank, might have taken President Kruger prisoner, if he had pushed forward more vigorously in the line of the retreat

This laxity has been excused on the ground of the fatigue of the men and the horses, or the approach of night. In fact, it was due to nervous exhaustion. The moral tension produced by danger causes physical fatigue so great that some men who have not stirred the whole day, but have been under fire for many hours, are rendered incapable of any exertion whatever. With the new weapons this tension is more severe than it used to be, and the depression is by so much the greater.

* * *

When the war began, the English were versed only in front attacks; but experience taught them to avoid such methods as much as possible. The front came to be considered impregnable and action was levelled at the flanks and rear. These new tactics, requiring great mobility and a wide range of action, found their instrument in the mounted arm, which accounts for the large and sudden development of mounted infantry. In February, 1900, General French's cavalry consisted of two brigades of cavalry of four regiments each, eight regiments of mounted infantry, and 1.970 Colonials, about 9,500 men and horses in all. It was soon found insufficient. * *

Then in the United Kingdom, as in the Colonies, the levies of mounted men were multiplied, and it was generally admitted that it fell to them to finish the war, while the old regiments of the Queen's Infantry, solid and well organized, were of no use but to serve as garrisons and hold the railways and blockhouses. The temptation of high wages brought in volunteers, who, as soon as they were got together, were sent into the field, even without being made into soldiers. Thence many mortifications.

The experience so dearly bought has introduced into the British

army a set of ideas on which most of its officers are agreed. These are the chief of them :—

The massed warfare of the beginning of the nineteenth century, which is still cherished in most of the European armies, must be superseded by a warfare of screens and of combined operations of numerous mixed columns.

The power of the rifle and the invisibility of the objects render it difficult to reach the enemy's front by actual charge. The decisive point of the engagement must therefore be sought in the combination of frontal and oblique fire. This result is often obtained by a wide enveloping movement followed by concentric action. But this manœuvre will not always succeed in putting the enemy to flight, especially if his force be superior to that of the attack. The assailant must then resort to a frontal attack.

In such a contest numerical superiority is not the decisive factor. That consists in approaching the enemy by an advance, protected by combined artillery and musketry fire, and carefully spaced out. Then when the zone of fire at close range has been reached, the personal valor of the soldier, whose initiative and courage are in free exercise without the possibility of control, becomes the condition of success.

Even in this case, it may be remarked, a charge may be repulsed. It is not enough for troops, numerous and brave, to get within short distance (say 200 yards) in order to succeed in their assault. The account of a German officer who was in the ranks of the Boers at the battle of Thabanchu (published in the *Militar-Wochenblatt*) brings this out clearly :—

The English cavalry had almost rushed our rear. Their artillery were commanding our right flank. We had been obliged to occupy several kopjes, to resist a threatened flank attack from the infantry. On that on which I was placed there were about thirty rifles, at three or five or more paces, behind solid boulders. On account of the shrapnel fire we could hardly raise our heads. With this support the English infantry had got close to a thicket of thorns, some 200 yards off, from which they kept up an incessant fire. Several times small groups of men had tried to make a rush, but were always forced to lie down again. At last the whole line, some 300 or 400 men, prepared to charge. We could clearly hear the voices of the officers ordering the men to cease firing and to fix bayonets, and the cry, "God save the Queen," gave the signal for the charge. All jumped up. As they moved upon us I had the impression of a thick gray-yellow line, almost elbow to elbow, starting to run two or three deep, as we do when charging in peace time. At that moment we began to fire. At first our fire was disorderly, but quickly it was brought within regular limits by the advice of some of the older Burghers : "Gently, young men, not one of them will arrive." The line came on, thicker than ever. But at about eighty paces its spirit failed. Some threw themselves down among the rocks and fired from thence, others turned aside and sought the shelter of the thickets, whence they could not emerge again. The battalion was destroyed, as a fighting unit. The losses, so far as one could judge, were heavy, but so many men remained lying down that it was impossible to count the dead.

* * *

On the 15th of December, at Colenso, the cavalry who were ordered to reconnoiter the enemy's front did not succeed in doing it. The patrols got as far as the limit of the effective fire of the Boer rifles, and then

skirted the dangerous zone, but could not penetrate it. The attack had to be opened by the infantry without any preliminary knowledge.

This failure of the cavalry to answer the expectations of its utility for exploring purposes was so complete that the troops ceased to rely on it for security. After the affair of Elands-Laagte and Nicholson's Nek the general in command gave up sending scouts out in front. The cavalry were equally unable with saber or lance to pierce the screen by which the enemy was surrounded. Their chief method of action became that of fighting on foot, which they carried on with their carbines and machine guns, like the infantry. The English cavalry are so thoroughly convinced of this change that they have discarded the carbine and lance, and adopted the infantry rifle. They dress like the foot soldiers; the only difference is that they wear a hunting spur on the infantry boot. The artillery are trying to combine the effects of powerful pieces with those of light quick-firing guns. They endeavor to place their batteries along an extended front and throw a converging fire, both direct and oblique, against a single point. The results obtained by the large lyddite shells have been slight. Their effect on men sheltered behind bolders or posted in deep trenches was nil. This was proved at Paardeberg, when 98 pieces of various caliber bombarded Kronje's camp—a square of less than 1,000 yards—at 2,500 yards range, for eight days and nights, and only put *hors de combat* some 100 men out of 4,140. The demoralization produced by the noisy explosion of the lyddite soon passed away, the effect of the shell being so feeble. Boers were seen to be thrown down by the wind of the projectile bursting close by them, and even their clothes were torn off, but they got up again without a scratch. The effect of shrapnel, on the contrary, was always dreaded.

The artillery duel, which used to be generally considered the first scene of the battle, is gone. The Boers have shown that it is often the true interest of the defenders to delay the opening of their fire and reveal their position as late as possible. With the intuition bred of novel requirements, they preferred to see the attack develop and let it take a definite form within practicable range, in order to overwhelm it by a well directed rifle fire. It has become the rule to split up great masses of artillery. Every body of infantry, however small, has in principle to be accompanied by horsemen to direct the march and guns to protect it.

The old maxim: "Fire draws fire," is changed into. "Visibility draws fire."

* * *

It is no longer possible to ascertain the strength of the enemy's forces. In this respect estimates are generally exaggerated. At Colenso the number of Boers was appraised at 18,000. It has since been proved that Sir Redvers Buller was confronted by from 2,500 to 3,000 men only, With the accelerated fire of a repeating rifle, one man shooting rapidly can produce the same effect as ten riflemen with ordinary firearms, and it is impossible to distinguish the difference.

One most important fact which must be insisted upon has been manifested in all the conflicts; and that is the attraction exerted by shelter and by the recumbent position. These two enemies paralyze the action and diminish the ardor of the combatant. A commander must now take them into account, as he does the forces of nature. The moral education of the man and the technical instruction of the soldier are the two levers by which the combatant may be drawn out of shelter and pushed forward. Not only is great effort required for this, but it is equally difficult to draw him to the rear again when he is once well engaged.

This explains the disaster at Spion-Kop. Under cover of night, the English had gained a position which was exposed on three sides to artillery and infantry fire. All day, in virtue of this adhering force, and in spite of enormous losses, they hung on. The survivors could not bring themselves to abandon the imaginary shelter they had taken until night fell.

* * *

The new arms are almost valueless in the hands of faint-hearted soldiers, however many there may be. On the contrary, the demoralizing power of quick-firing rifles and smokeless powder, which some armies still refuse to recognize, produces more and more effect on the enemy in direct proportion to the courage and coolness of each combatant.

So that a nation should, above all, strive to develop its moral powers. They alone will later on sustain the soldier in the anxious ordeal of battle, where death comes from the invisible.

This is the most important lesson of the South African war. Small nations will there find proof of the principle that in preparing their young men for the duties of soldiers, and in raising the courage of all up to the point of voluntary sacrifice, they are sure to remain free.

THE BRUSSELS-OSTEND RIDE—1902.

FOLLOWING are extracts from foreign service journals relative to the recent International Ride from Brussels to Ostend for valuable prizes, ostensibly as a test of human and equine endurance and therefore of interest to the Mounted Service. Elsewhere in this number of the JOURNAL,* will be found some comments from American cavalry officers, who have had great experience in the field both in individual distance rides and in long and rapid marches with mounted troops.

The *Revue de Cavalerie* (July, 1902) publishes a list of historic distance rides (given on p. 901) and says:

* See "Comment and Criticism."

HISTORICAL DISTANCE RIDES.

Date of Races.	Length of Trip.	Time in which it was made.	Average Speed per Hour.	Name of Horse.	Name of Rider.	Remarks.
	Kilos.		Kilos.			
Winter 1714	2175	16 days	135 per day	——	Charles XII	Varna to Stralsund with relays.
1860	274	24 hours	11.415 h.	——	Am. Courier	Civil War.
1860	160	8 "	20	——	" "	Civil War.
1864	1350	19 days	20	——	Lt. Muller	Allemand (Germ'n)
1865	3487	49 "	20	——	Gen. Sheridan	With 1000 Cavalry.
1867	1250	15 "	20	Caradoc	Lt. Zubovitz	Hungarian.
1881	560	5 "	20	——	Salvi	Passage of Carpath
1881	1800	15 "	20	——	"	Hungarian.
1882	168	15 h. march	11.2	La Mascotte	De la Comble	2d Lieut. 7th Drag.
Apr. 16, '82	100	10 h.	10	"	"	2d Lieut. 7th Drag.
" 30 "	172	14 h.	12.5	Bagne	"	2d Lieut. 7th Drag.
May 15, '82	100	13 h.	7.6	2 horses	"	2d Lieut. 7th Drag.
July, 1882	40	80 minutes	1 k. in 2 m.	Falcanio	Capt. Teryer	Courn to Vendome.
Oct. 14, '82	251	21 hours	11.992	La Mascotte	De la Comble	2d Lieut. 7th Drag.
Nov. 25, '82	147	11¼ (rep. ½ h. comp.)	12.250	Bagne	"	2d Lieut. 7th Drag.
1882	350	72 hours	4.86	La Mascotte	"	2d Lieut. 7th Drag.
1882	102	6 h. 10 m.	17	Graziella	Col. de Belle-garde	Moulins to Saincaize and return.
1882	1100	10 days	17	"	Salvi	Bergame to Naples.
1882	90	5½ hours	17	"	"	Turin to Casal.
May, 1885	160	18 h. 30 m.	9	"	Roehl	Lieut. 4th Cuir.
1885	114	9 hours	12	"	Lange	German.
June 22, '88	40	1 h. 29 m.	900 m. in 2 m.	Lio-horse	Lt. Godau	
1889	2665	30 days	"	"	Lt. Assicier	Lonbuy-Paris with 2 horses.
1889	222	21 hours	11	"	Sir Evelin	English.
1890	4000	62 days	11	"	Lt. Picchkow	Cossack.
Aug. 1891	182	19 h. 30 m.	9	"	Chomorin	
1891	265	2 days	9	Tristan	Capt. Ratazzi	Italian.
1891	900	10 days	9	"	De Dubitz	Lemberg to Prag.
1892	208	18 hours	11.550	Incartade	Lt. Valiter	22d Dragoons.
Oct. 1892	600	65 "	11.550	Athos	Lt. Stahremberg	Austrian.
1895	402	39 "	11.550	5 changes of horses	"	Austrian.
1896	2500	43 days	11.550	Detonation	Capt. Devedeix	Lyon to Vienna and return.
1899	1250	13 "	11.550	"	Cottu	Vienna-Paris.
Aug. 1899	1400	13 "	11.550	"	Capt. Spielberg	German.

"The endurance of the rider is, as you will see later, just as difficult to attain as that of the horse; the most famous example is that of Charles XII who, at the age of 32 years, escaped from Varna, where he was held as a prisoner by the Turks, made the trip on horseback from Varna to Stralsund with relays, a distance of 2200 kilometres in 16 days and 16 nights; it is true he went to re-conquer his kingdom.

"Two horses are necessary to each competitor and an aide (the probable horse and the supernumerary).

"No training on the spot. It is bad business. Push forward. The start over the road towards Ostend with affected delay is all indicated; when the horses are at their best, never make any more than 70 kilos.

"It is necessary to make the trip Ost-Brux on the bicycle, (with the bicycliste who goes along on the day of the trial) engrave the landscape in your memory, meditate, measure distances and make notes in

writing. Then, mounted on the extra horse, the one that made the worst showing at the training, undertake boldly the 135 kilos., and only after that, the rider will have an idea of the gait he should march and the confidence he can place in himself. To do this, is to raise your chance 25 per cent. Nothing to eat en route; horse and rider are accustomed to go 8 hours without eating.

"The bicycliste should carry everything necessary (beverage, Kola), he must know how to drive a nail, should a shoe become loose, must be able to get ahead of the rider to a place previously chosen to sponge the horse or to do whatever may be necessary.

"Do not fail to saddle a little to the rear; remember that the horse supports on his fore-parts a load of $\frac{1}{8}$ of his own weight and that the rider has $\frac{3}{8}$ of his weight on the fore-part of the horse.

"I will not mention the change of the shoulder—very little trotting being done, but I would say, change on the foot.

"Nothing can be profitable, after perusing the table herewith, than to follow the conditions of preparation of Lieut. Stahremberg, the victor of Vienna-Berlin, who has beaten everything so far. The following lines were written by himself:

'The rider must have a system, a programme laid out, measure the distances, study the territory, and especially before the march, put the endurance of the horse and rider to a test.

'I decided very suddenly to make a trial race to Berlin and made my preparations as cooly as possible.

'In the first place I tried to keep *Athos* fresh and well on his limbs, not making any great demands on him. I knew already that his heart and lungs were in good condition, but had no exact idea what a horse and a rider could endure.

'Notwithstanding the great summer heat, at the end of August, I mounted Athos and started on my trial trip and to reconnoitre.

'I divided my journey in 7 days. I always made an early start and covered each day from 75 to 80 kilometres in 7 or 8 hours. On the 7th day, the last one before Berlin, the weather being considerably cooler, I was enabled to make a forced march of 150 kilos. in 11 hours.

'In the stable in Berlin the horse did not show the least sign of fatigue. He was notoriously fresher than his rider, who had not made the 150 kilos. with the same ease.

'After a halt of 2 days at Berlin, we came back—Athos and I—by rail. We were both in just as good a condition as we were before starting.

'I had no doubt that Athos could easily beat his record of the trial trip. Everybody asked the question if I could stay in the saddle several days in succession, the same as the last day before Berlin, on account of 150 kilos. I covered that day.

'Before the trial I thought that the 580 kilos. would necessitate at least 4 days, but on my return to Vienna I reduced these 4 days to 3 days less 2 hours, or altogether 70 hours.

'I do not deny that I was afraid of my own boldness. I dared not to tell anybody of my intentions.

'I covered with relays 330 kilos. in 36 hours, and this result strengthened the confidence in myself to such an extent that I laid out my programme immediately and definitely—70 hours.

'My line was laid out for every day and locality. I designated the points where I was to stop at night or feed my horse, and divided the time, like an indicator on a railroad, in hours and minutes. I posted men at the different points where I was to stop, to take care of us.

'Athos traveled every day 4 hours at the different gaits, closely watched and kept fresh as regards lungs, heart and limbs. I led my same every-day life and looked forward with confidence to the time I was to begin the race.' "

THE COMPETITORS.

The list of competitors was reduced from 140 subscribers to 20 officers who came up to the conditions necessary for qualifications (80 kilometres in 4 hours and 120 kilometres in 12 hours in the preliminary trials).

THE PRIZES.

The principal prizes were as follows:

Prize of H. M. the King of Belgium.

1. Prize of Belgium—One work of art and 4000 francs.

Prizes of the Minister of War of Belgium.

2.	Prize of the City of Ostend,	Work of art and	2500	francs.
3.	" " International Committee,	" "	1800	"
4.	" " Mariakake,	Gold Medal and	1200	"
5.	" " des Dunco,	" "	1000	"
6.	" " de l'Estande,	" "	500	"
7.	Special prize on account of the Remount of the Belgian army.	Gold Medal and	1000	"

There are a number of other prizes offered by the Jockey Club, Race Club of Ostend, Royal Hippique Society, M. Lambert de Rothschild, prize of Wynendael, Society for Sport of Belgium, etc.

Finally, all those who will have made the trip in 11 hours, which represents an average speed of 12 kilometres to the hour, shall be classified and receive a diploma.

PRELIMINARY TRAINING FOR THE RIDE.

La France Militaire a few days before the race gave details as to the preliminary tests of men and horses.

"More than sixty officers had asked to compete; only twelve of these could be approved of, and notwithstanding the severity of the trial the Examining Committee, presided over by Commandant Varin, was in duty bound to qualify 20 candidates. It is known that 17 Frenchmen were at the starting point, Aug. 17th.

"Just see, besides the severity of the preliminary operations, according to the notes taken by a member of the commission, the manner in which the different series of elimination was accomplished. The success, gained by our brother officers of the French army is very significant by reason of the instruction gained thereby.

"The great centres for examination of officers desiring to take part in the raid were Amiens, Paris, Tours, Toulouse, Macon, Epnial and Vitry-le-Francois.

"Ninety-eight horses were engaged; 58 appeared for examination by the commission and 37 failed to pass.

"The fifty-eight horses examined are sub-divided as follows:

"1st. Sixteen thoroughbred.

"2d. Forty-two half-bred.

"Twenty horses were classed as absolutely qualified to undergo the final trial successfully.

"Of these 20 horses, 9 are thoroughbred and 11 half-bred.

"All the officers were present at the different centres between half-

past three and four o'clock in the afternoon, having made in 12 hours the run of 80 kilometres supervised by the Gendarmery.

"They then received a certificate stating:

"1st. That they had undergone successfully a trial of 80 kilos., with relays in the maximum time of 4 hours.

"2d. That a medical examination had, after the trial, testified to the absolute integrity of their organs.

"The number of relays used in the different regiments varied greatly. It ran from 2 (5th Chasseurs) to 12 horses (11th Dragoons).

"There has been no accident of any kind amongst the horses used in the relays.

"The minimum time over the route was made by Lieut. de Gombert, who, with 9 changes of horses has covered the 80 kilometres in 2 hours, 15′, that is a kilometre in 1 minute 41″.

"Lieut. Raoul 6th Cuirassiers, with 11 relays, has made in his track the 80 kilos. in 2 hours 19′.

"All the horses examined were found in a surprising fresh condition and had borne the gallop time of 5 minutes (440 metres to the minute) brilliantly, which has been imposed on them shortly after the examination. Only one horse had shown signs of exhaustion and failed to make the gallop time.

"The horses were mostly of a fine type and in a condition creditable to their riders.

"Their training had certainly been systematical because there was no visible sign of over-riding.

"The riders, full of spirit and mirth, did not show the least fatigue. All were delighted to have taken part in the first two trials and expressed the strongest desire to be chosen for the final test.

"The International Raid has been welcomed with enthusiasm in the cavalry and artillery regiments. It gave rise to many passionate hippic discussions, resulting in considerable exchange of ideas and in an increase of physical exercises."

La Belgique Militaire thus comments on the method of selection:

"The training with relays, taken by the numerous officers, is excellent exercise; it gives the rider an idea of his endurance and develops his whole system; but, in this last stage, it should be confined to training, without changing horses, to a distance nearly approaching that at the day of the trial.

"The employment of another horse does not put the rider fairly to the test—that is to draw as much as possible out of a tired horse.

"We will not insist further on the degree of training necessary to stand the trial; but those who have only trained their horses to 75 and 80 kilometres, must not believe that they are in condition to make the required distance of 132 kilometres; it is indispensable that the training be pushed to 120 kilos., as we have previously stated. If we insist on this necessity, it is to induce our friends to try their horses to the utmost, so as to be sure of the extent of their ability. Would it not really be better to retire from the contest rather than to make a bad record at the race?

"On this point we are in favor of the trials given to officers in France desiring to take part in the raid.

"Commandant Varin, Riding-master of the Military School at Paris, who has put the candidates to a test of 120 kilos. in 12 hours without relay, will have guarded the prestige and the good reputation of the French cavalry in selecting the best material for participation in the raid.

"To follow the example of the French riders, our young officers have made forced marches in the last few days which will count well in their favor on the 27th of this month.

"Captains Joostens and Crabbe made last Sunday, with only one single relay, the course Brussels-Ostend. The last part of the march was particularly interesting; at the relay from Olserre to Thourout the speed made was 22½ kilos. to the hour. The distance from Thourout to Ostend is 23 kilos., the road is excellent and in a straight line; it was run over by Capt. Joostens in 45 minutes and in regular gallop time.

"In order to try the endurance of our riders, one of them, 2d Lieut. de Blommaert, established a wonderful record last Wednesday over a distance of 80 kilos.

"The run took place at the Avenue de Teronereu over to 10 kilometre which separate the Park du Cinquantenaire from that of Teronereu; at each of the extreme ends of the avenue a relay was placed; another one mid-ways on the height of la Dreve des Trois Conleurs, so that each horse had only a run of 5 kilos.; 13 horses had been used in this race; 2 thoroughbred horses and one Irish, particularly tough, were mounted twice.

"The run of the central relay towards the Park du Cinquantenaire and return (10 kilos.) was made on an average of 16′ 20″ with the Irish horses and 13′ 30″ with the thoroughbreds.

"The other part of the run necessitated a change of gait at the cross roads on the heights of Quatre-bras, besides the descent towards Teronereu being particularly steep. The time employed in making this part of the road was 18′ 18″, 17′ and 16′ resp., thus showing some increase in the gait.

"Lieut. de Blommaert mounted his horse at 8 o'clock 5′ at the relay of Cinquantenaire; at 9 o'clock 29′ 30″ he had passed the first 50 kilos. and at 10 o'clock 16′ 30″ he dismounted from his excellent thoroughbred (this to Lieut. Reyntieus), having covered 80 kilos. in 2 hours 11′ 30″, that is 36¼ to the hour. The young officer did not appear to be in the least fatigued and if duty had not called to the barracks, could have continued the course in the same manner up to 100 kilometres.

"It is important to note that in these 2 hours 11′ 30″ is included the time necessary to change horses 15 times; admitting, the same as in France, that the rider losses 2′ to dismount and mount again, the run was actually made in 1 hour 11′ 30″."

RESULT OF THE RACE.

The Belgique Militaire says:

"The winner of the race Bruxelles-Ostende, Lieut. Madamet, 13th Dragoons, has covered the 132 kilometres in 6 h. 54′ 51″, that is at an average speed of 19 kilom. to the hour.

"The rate of 20 kilom. to the hour, foreseen by the 'France Militaire,' has not been attained, at least not during the entire duration of the race, but it depended, in the present case, on the bad weather and the defective condition of the road.

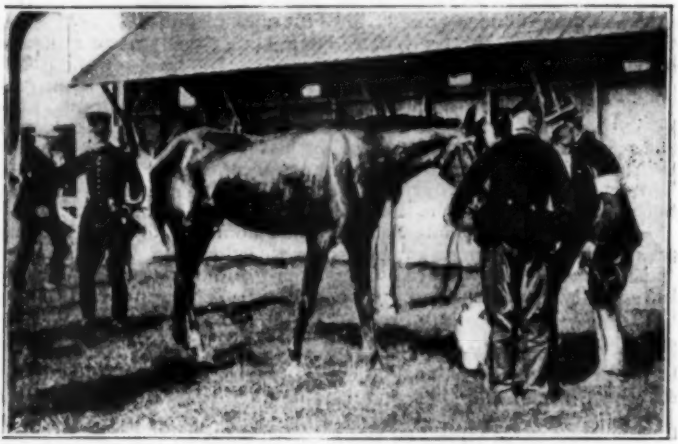
"The first 100 kilometres were made at the rate of 23 and 22 kilos., on an average, by Captain Smith-Kielland and Lieut. Bausil."

* * *

The time made by the twenty-nine coming in at the stake is as follows:

1.	In	6 h. 54′	Lieut. Madamet,	French	Dragoons.
2.	"	7 h 22′	" Deremetz	"	Hussars.
3.	"	7 h. 33′	" Haentgens	"	Dragoons.

ARRIVAL OF THE WINNER BRUSSELS-OSTEND RIDE.



THE WINNING HORSE.

4.	In	7 h. 36′	Lieut. Romieux, French Dragoons.
5.	"	7 h. 55′	Capt. Smith-Kielland, Norwegian Cavalry.
6.	"	7 h. 56′	Lieut. Godin de Beaufort, Dutch Hussars.
7.	"	8 h. 14′	" H. Joostens, Belge Artillery.
8.	"	8 h. 29′	" Gibson, Swedish Cavalry.
9.	"	8 h. 31′	" Marchand, Belge Artillery.
10.	"	8 h. 47′	" Maris, Dutch Cavalry.
11.	"	9 h. 2′	" Meynard, French Dragoons.
12.	"	9 h. 20′	" de Trazegnies, Belge Guides.
13.	"	9 h. 27′	" Marchal, " Artillery.

14.	In 9 h. 27′	Lieut. Lemercier,	Belge Artillery.
15.	" 9 h. 32′	" De Muenyuck,	" "
16.	" 9 h. 35′	" de Selliers,	" Guides.
17.	" 9 h. 38′	Capt. Crabbe	" "
18.	" 9 h. 48′	Lieut. Valder,	French Dragoons.
19.	" 10 h. 2′	" Vring,	French Hussars.
20.	" 10 h. 5′	" Momma,	Dutch Artillery.
21.	" 10 h. 8′	" Sheridan	Belge Lancers.
22.	" 10 h. 15′	" Terriere,	French Artillery.
23.	" 10 h. 20′	" Lanue,	" Dragoons.
24.	" 10 h. 21′	Lieut. Col. Erzey,	Dutch Hussars.
25.	" 10 h 30′	Major Dutillaeul,	Belge Chasseurs.
26.	" 10 h. 30′	Capt. Seurr,	Swiss Artillery.
27.	" 10 h. 35′	Lieut. Coupez,	Belge Guides.
28.	" 10 h. 40′	" de Montaign,	French Dragoons.
29.	" 10 h. 49′	" Dupont,	Belge Artillery.

"Our officers have reason to be proud of the results obtained, since of the thirty-one taken part in the raid, 12 have reached the goal.

"Of the seven artillerymen, 6 ran to the finish, and of the six places carried by Belgian officers, they have obtained five.

"Of seventeen Frenchmen entering, 10 have run to the finish.

"It is true that the French officers, better trained throughout, have taken the first places, and that is as it should be.

"The Dutch, of 5 entering, obtained 4 places, 3 were won by the Norwegian, the Swede and the Swiss. The Russian and the English were not classed, and the Greek failed to start.

"It appears that it is owing to the Swedish record of 100 kilometres in 4 hours 19′ that the Germans did not take part. In the actual race, the 100 kilometres have been covered in 4 h. 21′ (by the Norwegian Smith-Kielland) and in 4 hours 38 minutes (Frenchman Bausil).

"It is certain that if the weather and the conditions of the roads had been more favorable, the record of 100 kilos. would have been beaten by most of the competitors classed amongst the first ten or fifteen."

AMERICAN LONG-DISTANCE RIDES*

IN 1876 Captain Lawton rode from Red Cloud Agency, Nebraska, to Sidney Station, Nebraska, one hundred and twenty-five miles, with despatches for General Crook, in twenty-six hours. Rides of from one hundred and twenty to one hundred and fifty miles have repeatedly been made within the day and night by our ordinary troop-horses when not specially prepared for the work, and over very bad ground, and it is extremely rare that they have suffered serious injury.

There are few three-day rides by single horsemen which can readily be quoted; but other performances may be given which are akin to this one. We put aside all mere hearsay rides. Of these there is no end; but it is well to put on record only such rides as are proven by official reports, and of which the distance can be measured by clear evidence.

In 1873 Colonel Mackenzie rode his command into Mexico after Lipan and Kickapoo Indians, beat them a sharp fight, and returned across

* *Riders of Many Lands*, by Col. T. A. Dodge, U. S. A.

the border, making one hundred and forty-five miles in twenty-eight hours. In 1874 he again rode his command into Mexico after horse-thieves, making there and back, eighty-five miles, in fifteen hours. In 1880, Captain A. E. Wood, Fourth Cavalry, one of the most thorough horsemen I have ever known, rode, with eight men, in pursuit of a thieving deserter, one hundred and forty miles in thirty-one hours. Let him tell his own story. It shows just how the trick is done:

"In the month of September, 1880, I was stationed at Fort Reno, Indian territory; the paymaster had visited us, and in those days, after such a visit, some desertion was expected.

"About noon one day the latter part of September, the post commander sent for and astonished me by stating that the first sergeant of his company—Twenty-third Infantry—had deserted, taking with him a considerable amount of the company fund, and he wanted me to catch him if possible. He had discovered that the sergeant had bought one strong Indian pony and had stolen another.

"The direction taken by the sergeant was not known, but under the circumstances I thought that he intended to reach the railroad as soon as possible. The nearest railroad was in Southern Kansas—the nearest point Arkansas City, one hundred and forty miles as the trail then went. I took a detail of two non-commissioned officers and six men from G troop, Fourth Cavalry.

"The detail was taken from the roster, except the first sergeant of G troop, who asked to go with me; the horses belonged to the riders; none were selected as especially qualified for the trip. I rode the same horse that I had been riding for months.

"I took two pack-mules with the men's rations; they were loaded with about eighty pounds each. We left the post at 1.35 P. M. The day was quite hot, and knowing what was before me, I did not push the animals very hard for the first twenty-five miles, which distance we had made by 6 P. M. This distance brought us to Kingfisher Creek, where we halted for one hour—unsaddled, got something to eat, let the horses roll and graze, then groomed their backs and legs, saddled up and started at 7 P. M.

"We started and walked for thirty minutes, then took a trot for fifty minutes, when we dismounted and rested for ten minutes; adjusted the saddles, mounted, and took the trot for fifty minutes, dismounted and walked for ten minutes. We thus trotted at about a six-mile gait for a little more than fifty minutes, and dismounted and walked for ten minutes, until 12 P. M., when he halted and rested for twenty minutes. We then mounted and kept up the trotting for fifty minutes, dismounting and walking for ten minutes, until 4.50 A. M., a little after day-break, when we were so overcome with sleep that I allowed the men to dismount, unsaddle, and sleep for about an hour. My mind was so busy that I could not sleep much, so I awoke the men. We groomed the backs and rubbed the legs of the horses for a short time and resumed the journey as before. When we had gone about one hundred and twenty miles we again halted, unsaddled, let the horses rest, and made some coffee. This rest took three-quarters of an hour, after which we started and travelled as before until we reached Arkansas City at 8.30 P. M.,—thirty-one hours. Men and horses were extremely tired; one horse was quite lame in front. We rested the remainder of the night, the next day and night, and then marched to Caldwell, Kansas, thirty-five miles, the succeeding day. We remained at Caldwell two nights and a day, and marched back to Fort Reno, a distance of one hundred and fifteen miles by ordinary marches. All but one horse

seemed to be rested when we reached Caldwell. This horse was unserviceable when we reached Fort Reno, the others were apparently as good as ever. The above is a record of the hardest ride I ever undertook. The fatigue was very great; but a good night's rest completely restored all of us.

"At that time our mounts were purchased in Missouri and Kansas. The horse I rode was twelve years old; the others were a little younger. I think that the horse that was rendered unserviceable was made so by bad riding. His rider was not a very good horseman, and rode too heavily forward. I tried to correct this, but it is impossible to teach all the niceties of horsemanship on such a trip."

In 1870 four men of Company H, First Cavalry, bore despatches from Fort Harney to Fort Warner, one hundred and forty miles, over a bad road—twenty of it sand—with little and bad water, in twenty-two hours, eighteen and a half of which was actual marching time. The horses were in such good condition at the end of the ride, that after one day's rest the men started back, and made the home trip at the rate of sixty miles a day. In 1879 Captain Dodge, with his troop, rode eighty miles in sixteen hours, and Lieutenant Wood, with his troop, rode seventy miles in twelve hours. In December, 1890, Captain Fechet, with troops F and G, Eighth Cavalry, left Fort Yates at midnight, reached Sitting Bull's camp, forty-five miles distant, at 7.20 A. M., drove off his band, and rescued the survivors of the Indian police who had arrested and in the melee killed Sitting Bull. The two troops then scouted the country for ten miles around and marched back, reaching Oak Creek at 2 P. M., a total distance of eighty-five miles in fourteen hours. "The roads were frozen hard and half covered with ice and snow. At the end of the ride there was not a saddle-boil nor a broken-down horse or man." In 1880 Colonel Henry, with four troops, rode one hundred and eight miles in thirty-three hours, being in the saddle twenty-two hours. One horse dropped dead at the end of the march, but there was not a sore-backed horse in the regiment, and they started out again after a rest of twenty-four hours. The same command made a night march of fifty miles in ten hours.

General Merritt in 1879, with four troops, and hampered by a battalion of infantry in wagons, rode one hundred and seventy miles to the relief of Payne in sixty-six and one-half hours, and reached the scene in prime order and ready to go into a fight. Very long distances have been covered by cavalry regiments at the rate of sixty miles a day. Colonel Henry, an expert on this subject, speaking of hardening the men and horses of a command by a month's drills of from fifteen to twenty miles at rapid gaits, aptly says: "A cavalry command thus hardened, and with increased feeds, ought to be able to make fifty to sixty miles a day as long as required; and to such a command one hundred miles in twenty-four hours ought to be easy. The horse, like the athlete, needs training, and when this is done, his endurance is limited only by that of his rider."

In 1877 General Miles organized in Arizona a plan for accustoming men and horses to severe work by rides across the plains by a party of "raiders," followed by another of "pursuers." The parties were usually about twenty strong. The pursuers were not allowed to start until eighteen hours after the raiders, but the raiders were bound to rest six hours after marching eighteen hours, and again twelve after marching twelve more. The pursuers could "go as you please," but were ordered not to injure stock by hard riding. Of these rides, which are not under the spur of compulsion, a few may be given as of interest.

On September 17th, Lieutenant Scott, Sixth Cavalry, and twenty-five men, started from Fort Stanton towards Fort Bayard, and was overtaken in forty-two and one-half hours marching time, at a distance of one hundred and thirty miles. The pursuers, Lieutenant Pershing and twenty-seven men, made one hundred and thirty miles in fifty-four and one-half hours from start to capture. On September 25th, Lieutenant McGrath, Fourth Cavalry, and twenty-two men, started from Fort Bowie to Fort Apache; he made one hundred and seventy-three miles in forty-two hours' marching time. On September 26-27, Lieutenant Scott and twenty-five men, in pursuit of Lieutenant Pershing, made one hundred and ten miles in twenty-six hours ten minutes. On November 1-3, Lieutenant Pershing and twenty-two men, pursuing Captain Wallace, made one hundred and thirty miles in fifty-seven hours. Captain Chaffee, in pursuit of Captain Kerr, made on September 24-25 seventy miles in twenty hours with seventeen men.

These are but a few instances which any of our cavalry officers can duplicate from their own knowledge. I could quote very many more. Now, if we take the conditions under which these rides have been made, viz., a common-bred native troop horse, not always kept hard and ready for work; the exceptional weight carried, for all but the courier work was done with full equipment; the fact that most of the courses were over country without roads, or only trails, which are the merest apology for roads, and often hilly, and badly cut up; that the pace must be made for the slowest horses; and be such that weak factors in the troop shall be respected; that the incentive was thirteen dollars a month and simple duty, and not a splendid money prize of five thousand dollars and the commendation of emperors; and, above all, that the commands have uniformly been brought in without injury to man or beast, we shall find matter for justifiable self-gratulation.

CARRYING DESPATCHES.

Gen. C. F. Roe, N. G. N. Y., furnishes the following account of a ride made by him while serving in Oregon.

"Sometime in the fall of the year 1869, I was serving at Camp Harney as a Second Lieutenant 1st U. S. Cavalry and was Post Adjutant under Major Elmer Otis, afterward Colonel (retired). One evening about six thirty the Post Commander sent for me, saying 'he had received a message from Dept. Hdqrs. at Portland, Oregon, by courier from Canon City (seventy-five miles distant and the nearest telegraph office) and that he was ordered to send the enclosed orders to the Commanding Officer of Camp Warner with all possible haste, as it was important for that commanding officer to proceed at once to Fort Bidwell, California, to endeavor to prevent an Indian outbreak.' Major Otis directed me to detail two of the cavalrymen to get ready at once. I said I will volunteer to carry the message if you wish. Major Otis then said 'I would be glad to have you go but would not ask it. How long will it take you to get ready?' I said about half an hour and started away. I sent to Troop 'F' for detail of a good private and to Troop 'H' for a good sergeant, to report mounted, with two days rations and nose-bag full of oats, as soon as possible. I sent for my own horse; some ground coffee; a few hard tack and a piece of bacon; changed to my riding clothes, and reported in the half hour that we were ready. The Post Commander not being quite ready with his message, I will at this point describe the horse and equipments. The three were troop horses purchased by the government in western Oregon at an average price of one hundred and seventy-five dollars; they were about fifteen-three in

height; weighed about one thousand pounds each, and were the horses that were usually ridden at drills and on garrison duty generally. The equipments were the McClellan saddle, with saddle bags, two days' rations inside, the Army head halter and strap, bridle, nose-bag full of grain, a quart tin cup and saddle blanket, overcoat rolled and fastened on saddle.

"I, the officer, weighed about one hundred and eighty pounds and was six feet two inches in height. The Sergeant, Troop 'H' weighed about one hundred and forty pounds and measured about five feet six. The Private, Troop 'F', weighed about one hundred and fifty and measured about five feet eight. The Post Commander handed me the messages and directed me 'to go to Camp Warner as quickly as possible without regard to horse flesh'—the officers of the Post gathered about and those who were familiar with the country decided that the distance was about one hundred and fifty miles. One officer asked when will you reach there? I answered, I shall try to make it by early the second morning. This officer said I will give you thirty-six hours. It was just eight o'clock in the evening when we rode out of the garrison. There was a wagon road made by Govt. wagons passing through the country, what is called a natural road—that is not made or worked. The first twenty-five miles being through the valley of the Silver's River, the next forty or fifty miles through volcanic rocks, the next forty or fifty miles over an alkali and sage brush desert passing near Warner Lake of alkali water, and the next thirty miles near the mountains. There was not a human habitation the entire distance. As soon as we had started I made up my mind that for long distances the trot was the natural gait of the horse and if we should make six or seven miles an hour, and kept it up persistently that we could make the distance in a short time. We rode sixty miles by about five o'clock the next morning, stopped at Buzzard Canon, unsaddled and fed the horses the grain that was left in the nose bags, about three lbs. each, made a small fire, cooked a cup of coffee, broiled a piece of bacon on a stick, and remained there just one hour. Started again about six A. M., and then began the most difficult part of the journey as the road was rocky—through alkali and sand and for many miles the horses would sink into the sand up to their fetlocks. After we had been traveling three or four hours, the weather being quite hot I found one of the men was suffering from thirst, so decided to leave the road and go to a spring which was three miles off. This spring was of the alkali water and I calculated that I had lost about half an hour in getting back to the road. Drinking this water proved to be an aggravation as it only made us more thirsty, compelled us to drink frequently from Warner Lake (also alkaline) when we came to and traveled along it, and took the skin off our lips and the inside of the mouth. We kept on persistently at the trot and averaged six and a half to seven miles an hour, hour after hour. About two miles from Camp Warner we heard the trumpeter sounding the first call for Tattoo, and rode into the garrison just as Tattoo was sounding off, which was at eight o'clock P. M., at that garrison at that season of the year. I asked for the Commanding Officer's quarters and reported my arrival with orders, to Captain Hall, 1st Cavalry, the Post Commander. The officers returning from Tattoo roll-call came to the Com'dg. Officer's house and of course wanted the particulars as soon as they learned I had left Camp Harney the previous evening at eight o'clock. The detachment of Sergeant, private and myself all came in together, having been on the road just twenty-four hours. Deducting one hour for breakfast and rest at Buzzard Canon, and half an hour lost going off road to

spring, the actual riding time between the two garrisons was twenty-two hours and a half.

"I was kept up till midnight and started with Capt. Hall in an open wagon and two good horses to Fort Bidwell, California, sixty miles distant, at six o'clock the next morning—leaving my detachment at Warner. We were escorted by an interpreter and a couple of Indians on ponies. We arrived at Bidwell that same evening—found that the Commanding Officer, who was recently from an Eastern Station, had placed two or three Indian Chiefs of the Snakes or Piutes, in the guard house and in irons, and that the Tribe had come in demanding the release of the Chiefs and threatening to kill settlers. Capt. Hall directed the release of the Indians, as their being confined was an error of judgment—issued rations, and the trouble ceased at once. Capt. Hall and I remained two days and drove back to Warner in one day. The officers at Warner told me, the horses we rode from Harney had been brought up for inspection the day I left and were found to be in excellent condition, the private's horse having a sore back—mine, they said, reared and plunged as he was led by. I remained at Warner one day, and then we started back, the Sergeant and myself riding the same horses, and the private another, leading his own as he had a sore back—which was the sixth day after our long ride. Leaving in the morning we made the distance back by the following evening—about thirty-six hours—bivouacing out over night.

"The principal points are: First.—The fact that the ride was made without any previous training whatever, on the part of either horse or man.

"Second.—That nearly the whole distance was made on a trot—not fast, but continuous.

"Third.—That the road and country was rough and uninhabited.

"Fourth.—That the entire party of three went through—and returned.

"Fifth.—That the only injury to any of the horses was a sore back to one.

"These same horses were with the troop for several years afterwards, performing their regular duties. I rode mine for a year or more, and on another occasion rode him forty-five miles in five hours."

MILITARY NOTE.

WASHINGTON, September 19, 1902.

GENERAL D. E. SICKLES,
Gettysburg, Pa.

My Dear General Sickles:—

My plan and desire was to meet you at Gettysburg on the interesting ceremony attending the unveiling of the Slocum monument; but to-day I find myself in no condition to keep the promise made you when last we were together. I am quite disabled from a severe hurt in one of my feet, so that I am unable to stand more than a minute or two at a time. Please express my sincere regrets to the noble Army of the Potomac, and to accept them, especially, for yourself.

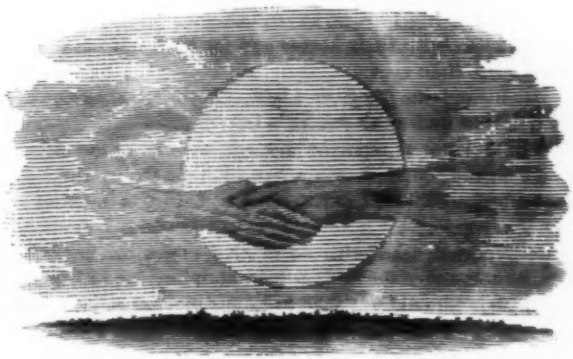
On that field you made your mark that will place you prominently

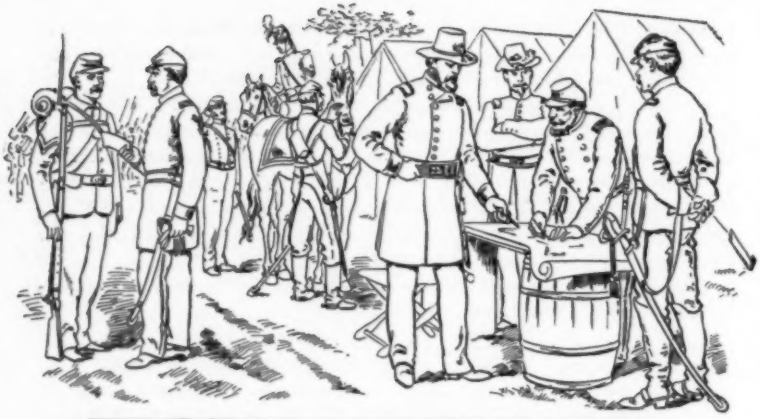
before the world as one of the leading figures of the most important battle of the Civil War. As a northern veteran once remarked to me: "General Sickles can well afford to leave a leg on that field."

I believe that it is now conceded that the advanced position at the Peach Orchard, taken by your corps and under your orders saved that battlefield to the Union cause. It was the sorest and saddest reflection of my life for many years; but, to-day, I can say, with sincerest emotion, that it was and is the best that could have come to us all, North and South; and I hope that the nation, re-united, may always enjoy the honor and glory brought to it by that grand work.

Please offer my kindest salutations to your Governor and your fellow-comrades of the Army of the Potomac.

Always yours sincerely,
(Signed) JAMES LONGSTREET,
Lt. Gen'l. Confederate Army.





Comment and Criticism.

The Brussels-Ostend Ride—1902.

Lieut. H. Joostens, Belgian Army.*

The violent attacks of the Press are very painful to all officers, who have taken part in the raid as they are all passionately fond of their horses.

The French particularly, who have pushed the equestrian art to such perfection, who live with their horses and for their horses, have learned to love them more than ever.

Lieut. Bausil and the English Lieut. Gibson really wept on seeing their horses failing under the strain.

The acts of violence as reported did not occur. I, for my part, met all the riders on the course, having been first passed by them and overtaken them afterwards, and I must say that no ill-treatment of any kind took place.

My mare, reported dead with so much generosity, has not suffered in the least, on account of the raid, notwithstanding the 12 kiloms. of gallop at the finish. She did not even get the spur and could, after a little time, have gone over the course again and done better, without suffering therefrom in any way. I intend to send you her photograph taken the day after the race.

And why were there so many dead horses?

1st. On account of the enervation and the extraordinary excitement of all riders in the international contest. All went too fast in the start.

2d. The distance was never run over in a race and errors were made in judging the endurance of the horses. If the race was to be run over again, you would see all the riders start off calmly—the same as the

* Letter in *La Belgique Militaire.*

Dutch did—and come in with horses fresh, and I believe in just as good a time.

All the trouble, therefore, was caused by excessive excitation in the contest, which would never happen again under the same circumstances. Those who managed to avoid that failing, stood the test nicely without exhausting their horses.

Everybody is aware of the splendid condition of the Dutch horses and the first three French horses arriving at the stake, and everybody admired on Wednesday, the day of the race, the suppleness and freshness of the winners.

The suffering of the horses should not be exaggerated. Kept up by their blood and their nerve, they go, without pain, until they are stricken with congestion, which attack comes on so quick that not even the rider can foresee it. The English, who attack us, seem to forget that in a fox-hunt, when the fox takes the horse over a long distance with considerable speed, three-quarters of the riders leave their horses *en route*, either dead or foundered.

It is necessary to draw a certain line in this discussion. We have learned what demands can be made on a horse under hopeless circumstances. We know the limit of their endurance.

I cannot better conclude than by giving you an extract of an interesting article in the *Gaulois:*

"The question may be asked (says the writer of the article), what was the real aim of this race and what was gained by this experience with a view to horsemanship in general, and horsemanship in time of war, in particular. We believe the last was specially kept in view; to go nearer the idea, one could judge that it could be applied in giving officers points, or in the language of the French regulations: To reconnoitring parties, which is, in the field or in the manœuvres, the swift action of a cavalry officer, alone or often accompanied by a small number of cavalry men—say from 1 to 6 or 8—well mounted and intended to accomplish a difficult mission in a minimum time in the direction of the enemy in order to gain information for the command.

"From this standpoint, the raid of Belgium is certainly very interesting, if not entirely conclusive.

"It is also interesting as a distance race. The 135 kiloms. are sufficient as a criterion. Truly, a reconnoitring party may be called upon to go farther—say 150 to 180 kiloms. and over—but not in a race against time. It may therefore be inferred that the horses of the last raid, with better management, are all capable to clear easily the maximum run of a reconnoitring party."

The article concludes as follows:

"Concerning the raid run in Belgium, we are at present certain of one fact: It is that all those who have taken part in the raid, could make, with similar mounts, in case of extreme necessity 100 kiloms. in 4 hours, and with ease 135 kiloms. in 6 or 7 hours.

"And on the whole, these exertions, in that they are excessive, may be of great use in time of war in urgent cases.

"The order at Waterloo—from Napoleon to Grouchy carried by an officer who never arrived at his destination; this order, what would you rate its price in money? The price of a horse is not considered in a mission of that kind. Its loss does not count for anything.

"Consequently—even as exaggerated—this severe race, hard on the horses, accomplished in Belgium by cavalry officers of all nationalities, remains just as meritorious as valuable.

"And as regards the personal effect of the riders engaged in this trial, it is enough to mention the enthusiasm it aroused on their arrival at Ostend amongst the spectators, by those who understood, as well as by those who did not understand."

Major-General Charles F. Roe, S. N. Y., (Late Captain 2d U. S. Cav.)

I do not consider long-distance rides of any value unless the horse is brought in, in fair condition. The only time, where haste might be required, is when an important order or message has to be carried in the shortest possible time. As a matter of course, the horse must be taken through or the message will not be delivered. As a rule, not more than two men will be ordered to carry the same message, so the fact that four or five horses out of sixty-two, as in this ride, only shows that there were four or five horses of exceptional endurance, and proves nothing as to the riders. In my opinion no horse should be ridden at the rate of twelve miles an hour for more than two hours, and then only under exceptional circumstances.

Major James Parker, U. S. Cavalry, A. A. G.

The military advantage of this contest is difficult to discover. As a courier ride it shows little that has not been demonstrated hundreds of times before. As a contest of endurance of the horse such rides hardly present conditions that are fair to the horse. We are fond of comparing the endurance of a man with that of a horse, it being often asserted that a man, in the long run, can out-march a horse, but for a test of endurance and speed the horse is usually weighted down by a load of, perhaps, one-fifth of his own weight, while a man carries no load. The horse is forced to make a certain speed, the man is the judge of his own speed; and on campaigns the horse often goes without his natural food, whereas the man, or rather the foot soldier, is sure to receive his rations.

This contest is called "an international raid," as though conditions were such as would occur during a military raid into an enemy's country. This is not at all the case. In marching at increased gaits a single man can march much more comfortably than a small detachment, and a small detachment much more comfortably than a troop or regiment. So much is this the case that I believe it would be easier on the average

horse to go, say 75 miles at six miles an hour as a courier than to go 50 miles at five miles an hour in the ranks of a squadron. This great difference is due to the dust, to the increased heat, to the worry and fretting of the horses, to the crowding in ranks, and principally to the necessity the trooper is under in keeping a fixed distance between him and the trooper in front, whereby every check in the column is transmitted with increased effect from the head to the rear of the column, so that the average horse is constantly being pulled up and started off again at an increased gait and with great suddenness, thus causing much fatigue to the horse.

In a raid as it occurs in war the cavalry troops are under the necessity of marching not more than 4 miles an hour, for the reason that they have to give time for the advance-guard and flankers to examine the country as they proceed.

The writer had occasion in 1894 to make a march with a detachment of about 20 men of 92 miles, in less than 24 hours, which was accomplished at the rate of about 6 miles an hour, the detachment resting over night seven hours. The method employed was to trot ten minutes at nine miles an hour and to walk ten minutes at three and a half miles an hour, alternately, the men dismounting and leading when the horses walked. To prevent alternate urging and checking of the horses when in column, the detachment marched in two squads, the leader of the second squad keeping a uniform gait without regard to his distance from the first squad. To avoid dust the men marched in columns of twos and on opposite sides of the road, selecting the soft parts of the road to prevent pounding of the horses feet. The horses were watered quite often, but in small quantities. On arrival at their destination, San Francisco, California, the horses were in good shape, and, on the next day, when the detachment turned out in full dress, they looked so well and acted with so much spirit that it was difficult to persuade bystanders that they had made this remarkable march. The principle of riding at a fast trot and leading at a fast walk, dividing a command up into detachments which march at uniform gait, can be applied to large commands, and enable them to make great marches without material injury to the horses.

In this "military raid" in Belgium 80 miles was accomplished in 6 hours and 20 minutes, or at about thirteen miles an hour. This is wonderful, but it does not teach anything about Cavalry. In my opinion there is no troop of cavalry existing that would not be ruined if it should attempt to go even 20 miles at a rate of over ten miles an hour.

Captain Guy H. Preston, 13th U. S. Cavalry.

In response to the invitation of the Publication Committee that I submit comments upon the article "International Military Distance Riding" from *La Belgique Militaire* and a clipping from the New York *Sun*, announcing the result of the "Race," I take professional pleasure in replying as follows:

I cannot see the utility of these tests. Mounts are trained in cavalry for no such exigency and there is little likelihood that in any war many of them would be called upon for an ultimate test of endurance. The development of the field telephone and telegraph has greatly curtailed the functions of the mounted courier upon whom dependence was formerly had for rapid transmission of intelligence. If it be claimed that it is important to know just how far a horse is able to go, why not assume the data from the record of many rides which have been made by individual troopers, when there was a real necessity for their arrival, transcending the considerations of the value of the animals and their humane treatment? Life-long association and brother-hood with the horse affords to all true cavalrymen quite sufficient opportunity to judge his capacity for ultimate, strenuous endeavor.

I believe that in the training of bodies of horse, endurance tests are fair to the point only of determining the capacity of the weakest mounts, which is the determining factor of the radius of action. Usually such a test would fall far short of inhumanity, the temporary indisposition of several individual animals nearly always imposing sufficient restraint upon the command at large. Indeed the larger the command the less the distance to which it may be forced in march. Every experienced cavalry officer has had occasion to guage the speed of his command by the inability of some particular trooper's mount to keep up with the column.

The primary consideration in the organization of cavalry as a separate arm of the service I believe to be the preservation of mounts. Go right up into the War Office and the Military and Appropriation Committee Rooms and it will be found that the nation has an eye to the cost, even if sometimes it seems to be a winking eye. If then the cavalryman was born to take care of his horse, and is employed and paid and trained to make him last, why should he be encouraged to run him to death. Racing beyond the distances for which good sportsmen enter private horses the world over, can be nothing else than inhumane. The true sportsman'a standard of honor and humanity is not a bad standard for the true cavalryman. In any event the cavalryman's standard should not fall below that of the sportsman. If racing horses a hundred kilometres is unsportsmanlike it must also be unmilitary, since soldiering is the greatest sport in the world.

I am happy to say these remarks are not original with me. They are taken from the mouths of U. S. cavalrymen in the mess-room where every man speaks his own heart's sentiment. It may be pleasing for some of your readers to note that a very tender sentiment prevails in our service for the animal who,—not which,—bears us whither we will. We are only sorry the exigencies of the time compel us to swap horses, whenever we change station.

Bvt.-Lieut.-Colonel T. A. Dodge, U. S. A.*

Let me quote some isolated facts quite apart from the Civil War, to

* From "Riders of Many Lands," by T. A. Dodge, U. S. A. New York, Harpers; 1894.

show that our cavalrymen on Indian service have not only stout hearts under their army blue, but stout seats in the saddle as well, and earn credit for them both. Mention need not be made of the risk every scouting party or detachment runs of perishing in an Indian ambush, like Custer or Forsyth; nor of horrible marches of many days with the thermometer at 40° below zero, like the command of Henry, when the bulk of the men were frozen to death, or frost-bitten so as to lose their feet and hands. Let us look at some good distance riding, for it is in this that our men especially excel.

But to do this calls out another side issue by reminding us of the celebrated ride between Berlin and Vienna, and we may as well recall its incidents. There has been much honestly severe criticism of this noteworthy performance.

"But what good came of it at last?
Said little Peterkin.
Why, that I cannot tell, said he.
But 'twas a famous victory."

Let us view it from every side.

Imprimis: So far as the endurance of the riders is concerned it counts for nothing. The best time was three hundred and fifty miles in three days—a mere trifle. Why, in 1858, J. Powers rode one hundred and fifty miles in six hours and forty-three minutes in San Francisco; in 1868, N. H. Mowry rode, on the San Francisco race-track, in the sight of gathered thousands, three hundred miles in fourteen hours, nine minutes; and one Anderson, in the same city, rode one thousand three hundred and four miles in ninety hours. The fact that these men frequently changed horses only adds to the splendid character of the feat, so far as the man is concerned. But this is not all there is to the Berlin-Vienna ride.

* * *

The ride of these seven score army officers between Berlin and Vienna has two interesting aspects: the amount of endurance of the animals ridden, and the judgment of the riders as to the capacity of their horses to perform. How these two items compare with what our cavalry is daily experiencing on the plains is a fruitful subject of inquiry.

As the crow flies, it is three hundred and twenty-five English miles from Berlin to Vienna. By the road it is variously called three hundred and fifty to three hundred and seventy; it is certainly short of the latter distance. Count Stahremberg, the winner, covered the distance from Vienna to Berlin (which, owing to the mountainous section being crossed in the early part of the ride, is easier than the course from Berlin to Vienna) in some minutes less than three days. Three other men came in within three days and three hours. The best German rider, Lieut. Reitzenstein, took a trifle over seventy-three and one-half hours. This sounds like a set of wonderful performances. Are they really so?

The race was really go-as-you-please. The riders successively started from Vienna or Berlin at different hours, and rode at any gait or speed, and by any road they chose. The horses were the very best; no one not owning a horse noted for unusual endurance would have been fool enough to enter. There were many thorough-breds, many native horses, Prussians and Hungarians, some ponies from the Carpathian and Transylvanian uplands. The animals had all been prepared by weeks of careful training. They carried the least possible weight—the winner, *e. g.*, rides but one hundred and twenty-eight pounds, plus saddle and bridle. The roads were the very best. Under these most favorable conditions the winner rode one hundred and twenty miles a day for three consecutive days; the others less.

There has been a disposition among Anglo-Saxons to underrate this performance. The large number of horses killed or foundered with good right distresses our sense of pure sport. But for all that it was a famous ride, though open to serious criticism. Any horse ridden one hundred and twenty-five miles in twenty-four hours performs a great feat; one ridden two hundred miles in forty-eight hours, a greater; to ride three hundred and fifty miles in three days or a bit over is little short of marvelous, if you bring the horse in free from permanent injury. But there's the rub, and it is on this point that there is a word to say.

* * *

The nearest approach to the Stahremberg ride by an American which we can at the moment recall is that of the pony which Colonel Richard I. Dodge personally knew, and which I have already mentioned. His owner was a professional express rider, who carried the mail from El Paso to Chihuahua, thither once a week and back the next. As the country was infested by Apaches, the man had to ride by night and hide by day. His practice was to ride the distance, three hundred miles, in three consecutive nights, and rest his pony four days between trips. "Six months of this work had not diminished the fire or flesh of that wonderful pony," says Colonel Dodge. It is true that three hundred miles is not three hundred and fifty, but this pony—probably not over fourteen hands, and with rider, mail, and the usual plains trappings, carrying at lowest two hundred pounds—used to make the three hundred miles in some sixty hours (*i. e.*, three nights and the intervening two days), an equal average rate of speed as that of Stahremberg and a much higher rate while going, and no one pretends that the Count or any other of the Berlin-Vienna riders could have turned round and done the same thing over again the succeeding week; whereas this little marvel kept on doing it every week for six months, and no one knows how much longer, over a country having no roads deserving the name, by night, and feeding only on bunch-grass. Which of the two is the better performance? This one cannot, perhaps, be equalled; but to ride and repeat nearly as great distances has never been and is not to-day considered an exceptional thing on the plains.

And if this pony outdid the winner of the great German race, by how far does he outrank the losers? The horse ridden by Count Stahremberg was brought in, in fairly good condition, but died within a day or two. The horse of the German winner died. A very high percentage of the others either died or broke down midway, or were ridden home moribund or ruined. They were kept up, on dit, by all kinds of stimulants and nostrums on the road. No accounts have reached us showing the condition of the horses' backs under the saddle, always a prime proof of careful or unintelligent treatment. In fact the number of dead or maimed animals seems to be purposely suppressed. That it was the ponies which came in with the least injury will not surprise our Western men. While a thorough-bred may outpace a pony, a ride which will kill him will not permanently disable the little runt of the prairie. The latter's ancestry has had to struggle with too much hardship to be easily killed, while the thorough-breds have been warmly housed and artificially handled. The pony's heritage is to do and endure; the thorough-bred's to make pace.

Major D. L. Brainard Sub. Dept., U. S. A.

The results attained in the international military ride from Brussels to Ostend appear, from a military standpoint, to be of little value.

It is not clearly seen where the lessons learned in this ride may be applied to advantage in the military service, and in view of the brutal methods, which seem to have been employed by the riders, it is believed that such competition should be discouraged.

The special severe training of individual horses for rapid rides, for all practical purposes in the Army, would be a useless expenditure of time and energy, for in an emergency horses will always be found in every command that will respond to any reasonable demand made on their powers; and it is well known from past experiences what may be accomplished by a well-bred horse in good condition, in a given time.

In support of the statement as to the uselessness of severe training of individual horses for rapid movements, I recall an experience of my own in making a long and fast ride on a troop horse that had no training other than what he received in regular drills and marches, in which all the other troop horses participated. Moreover this animal was not thoroughly acclimated, he having been purchased in Missouri and shipped to Montana only ten months before the ride was made.

On the last day of August, 1877, I was selected by Captain (now Colonel) D. W. Benham, 7th U. S. Infantry, commanding Fort Ellis, Mont., to carry an important despatch to 1st Lieut. G. C. Doane, 2d Cavalry, temporarily commanding Troop "C," 7th Cavalry and Crow Indian Scouts, in operation against the Nez-Perce Indians, who were moving in a northeasterly direction across the Yellowstone National Park with the view of escaping through one of the passes of the Absaroka Mountains. Lieut. Doane had left Fort Ellis two days before, and

on the night of the 31st was expected to camp with his command at Henderson's Ranch, near the present town of Cinnabar, Montana, distant from Fort Ellis about sixty-four miles.

Upon receiving notification of my detail for this duty, I was permitted to select from among the extra horses of my troop a well-bred sorrel, standing about fifteen hands three inches high, and weighing approximately ten hundred and fifty pounds. For over four months this animal had been in the field, marching almost constantly, but for the last fifteen days he had been in the post where he was allowed to run at large during the day, being stabled and fed at night. He was young, spirited, of great endurance, and at this time was in perfect form.

Leaving the garrison at noon, just as the Orderly trumpeter was sounding dinner call, the horse, of his own volition, broke into an easy, swinging gallop, continuing this pace almost uninterruptedly for twenty-five miles, when he lost his off-fore shoe. Fortunately the accident occurred while passing a ranch, where I had the good fortune to discover a farm-hand with sufficient skill to make the necessary repairs. After a delay of twenty-five minutes I resumed my journey, galloping without halt to Bottler's Ranch, ten miles further, where I dismounted, unsaddled, and allowed the horse to rest for half an hour. Henderson's Ranch was reached at nine o'clock; the actual time consumed in travelling, halts being deducted, was about eight hours. At the conclusion of the journey the horse was in perfect condition, though somewhat leg-weary, and was equal to many more miles that same night. The following day he was ridden by me a few miles, and with the exception of a slight stiffness in his fore legs for the first few minutes after mounting, there was no indication of the severe test to which he had been subjected on the preceding day. Considerable weight was carried; two blankets being used folded under the saddle, which in other respects was packed with the regular field equipment, including overcoat, canteen, lariat, etc. In addition I had a carbine, revolver, one hundred rounds carbine and thirty-six rounds revolver ammunition. The weather was cool and bracing, the road was excellent, and, with the exception of perhaps three miles of hilly country, was nearly level. In crossing these hills I relieved the horse by dismounting and leading him at a walk up the slopes, running down on the opposite side, he following at a trot.

On the latter half of the journey several small streams were crossed, at each of which the animal was allowed two or three swallows of water: he appeared thirsty, and as the quantity of water given him was slight, it apparently did no harm and probably added to his efficiency.

With the exceptions noted, the entire trip was made at a gallop, my mount appearing to prefer this gait, for he always returned to it without urging when occasionally brought to a trot.

There was no undue haste, the horse not being urged beyond the pace which he himself set from the start. On the contrary, I often moderated his speed when it appeared that he was galloping too rapidly.

My own condition, during and after the ride, was excellent, but the following day I experienced a slight lameness in my thighs, shoulders and chest. This, however, was trifling and quickly passed away.

Major G. H. G. Gale, 9th U. S. Cav.

The recent international military ride from Brussels to Ostend appears to have demonstrated no new principle and to have served little or no useful purpose.

From the published accounts it appears that the winners were Frenchmen on French horses, and this may perhaps be used as an argument in favor of the superiority of the French Cavalry, but it must be remembered that this has not been a contest of detachments but of individuals and the circumstances in the two cases, are so entirely at variance as regards comparison of troops, that the conclusion is still undetermined.

The fact has been demonstrated that, under certain conditions, a selected horse, previously had in training, may be able to endure a pace of 13 miles an hour continuously for a period of over four hours, and the knowledge that it has actually been accomplished is of course, an item of professional interest, but the probabilities that horse and man will ever, in service, be called upon to perform this task, are so remote as to recall forcibly Mr. Lincoln's story of the defenses of Washington, and for practical application it seems almost akin to a pie-eating contest or a century run.

The individual ride has always been a favorite theme in song and story, and it is a strange coincidence that in this instance the rate of 13 miles an hour should be almost identical with that accredited to Dick Turpin in his famous ride from London to York; the fate of so many horses in this race, if not that of the winner, goes far to discredit this performance, the truth of which has always been questioned. Turpin's ride had at least the virtue of doing somebody some good, which appears to be lacking in the present instance. In general the poets have sung the praises of heroes whose performances were well within the limits of endurance of both man and horse.

Some ten years ago in a similar race between Vienna and Berlin the winner made the journey, something like 350 miles, in three days, and as stated also in this case,* the horse died. A similar race was planned between Deadwood and Omaha recently, to take place during the President's western tour, and its abandonment at Mr. Roosevelt's request has been universally applauded as a triumph of humanity and common sense.

To be of any use in a military sense, a competition of this character should not be confined to the individual man and horse, but should include a sufficient number of representatives in each group to simulate actual service conditions, and should be preceded by only such training as may be possible under actual service on field conditions. It might

*This proves to be an error in early press statements: the horse arrived in good condition.

then be possible to judge of the comparative excellence of horses and horse management, and the prize should go to the detachment coming in in best condition, due regard being had for speed, rather than to the one which made speed and distance the only requisites, to the sacrifice of effectiveness.

As regards the staying powers of the man, there is no question, as in the case of Powers, in San Francisco, in 1858, who rode 150 miles in six hours and forty-three minutes, and Mowry, in 1868, who rode 304 miles in ninety hours. Of course these records were not made with one horse and they merely prove that the limitation is of the horse and not the man.

Many instances might be quoted in which the horse has had no previous training other than that of service and has rendered good account of himself without the sequel of dying at the end of it.

But it is the long distance work of detachments that is the test of cavalry. General Mackenzie rode into Mexico, had a fight and returned across the Rio Grande in twenty-eight hours. This was a distance of 145 miles and was accomplished by a squadron.

Colonel Dodge mentions many instances of long and arduous marches of cavalry detachments in the United States and in fact the summation of all these may be put: that a cavalry commander who cannot, if emergency requires it, put his command over seventy-five or a hundred miles in the twenty-four hours, has been either negligent or unfortunate.

"Training the National Guard Officer for National Defense."

Lieut. Colonel James Regan 9th U. S. Infantry.

The term National Guard, is, under its present organization, a misnomer. This was pointedly demonstrated at the beginning of our recent war with Spain. It was cogently claimed then, that the General Government had no right under the Constitution, to call into active service, the organized regiments of the States, but, to call only for the quota of men from the States respectively. Right or wrong, this claim was seriously made. The laws relating to our Militia are old-fashioned and far behind this scientific and inventive age. Yes we are in need of a "National Guard," call it by this name, or 1st, 2d, or 3d reserve, but let it be clearly understood that it is for the National defense and subject to the constitutional call of the President. Its organization is of vital importance, and it is only after it is effectively organized, that the best results can be obtained by any system of military education, and certainly a uniform system of education cannot possibly be successful under forty-five independent organizations of the present National Guard. There may be less, but it is only by assimilating and borrowing from each, they are independent, just the same, under the constitution. There is no reason why we should not have an up to date organization of the Guard, because we can find such a system in Europe, where they have given such organizations the closest and the most scientific

thought, rendered necessary by the delicate relations between those nations. It can be adapted to suit our laws and peculiarities.

It does seem as though it would be a wise scheme and precaution, to divide our nation into districts, let them be as extensive as the circumstances may indicate, as good points of concentration, supply and transportation. Such districts to have organizations to suit density or sparsity of population, and under that sound principle, "in Peace prepare for War," should be from the Company up to include the Corps. Such a system of organization may be among the unattainables, on account of the gigantic task of getting forty-five different combinations to think alike.

In the meantime, the military education and training of our people ought to be encouraged in every way, not that we wish to be a military people, but to be prepared to guard our independence and all the rights incident thereto. The most essential thing in the organization of the National Guard, is to have its units and practices to accord strictly with those of our standing Army, or "The Regulars," as they are styled.

The detail work of the Company, its interior economy, cooking, company books, returns etc., the means and forms of obtaining supplies and stores, and the hundred little details, should be the same as in the Army, and so on throughout the higher units to the Corps. A full number of staff officers should be detailed for each unit, and changed when necessary, to disseminate this special knowledge.

Under a uniform organization of the Nation's Guard, it would not be necessary nor would it be possible upon economic grounds, to keep large numbers of the National Guard under arms, but, with the education proposed by the papers under discussion, or such modifications thereof to suit conditions, when they did meet they would meet on common ground, would learn from each other, and there would be no serious clashing.

If ever a uniform system of organization is attained, and the system of education theoretically and practically, as indicated, is established, then the best results and the highest order of *esprit de corps* will be attained, by allowing the officers on duty with an organization, the company to the highest, to go forth with it in the event of war. The independent volunteer regiments organized in the recent war, were good regiments, but a little peculiar in the method of formation.

The elective system of naming officers for appointment is a bad one; the standard should be fixed, and the system now in vogue in the Army should be followed.

Reviews and Exchanges.

The New International Encyclopædia.*

TO review an Encyclopædia, or even to study it sufficiently to be able to pronounce upon its merits as a book of reference, is a task that few men would care to undertake. Its accuracy might be tested by selecting articles here and there, and verifying their statements by reference to standard works on the subject, but such a test would hardly be conclusive. Discoveries have been made since most of the standard works were published. Their records halt, it may be, several years ago; but the march of invention, the spinning of history, the flight of Time, have not halted. The chain of cause and consequence drags along, and oftentimes the links are hardly recognizable as legitimate descendants of those whom one may call their forefathers. And so works of reference will get old, and ultimately almost worthless in their intended rôle. Encyclopædias therefore must renew their youth from time to time or surrender their titles as authorities to younger heralds of the truth. One is not surprised therefore to meet a new Encyclopædia in the English tongue, although he may have learned to venerate and love the friend and companion of his later years The Britannica.

As the purpose of the great English work and that of the International are similar, but, if one may be permitted to judge from a limited view, not exactly the same, it is not surprising that there should be a strong family likeness between them. The subjects treated, and even definitions and descriptions, are very much alike, although the International condenses wherever condensation is possible without affecting the clearness of the picture. All this is natural enough if one's diagnosis be admitted. The Britannica's scientific articles were written by scientific authors for scientific readers; the International's by able and distinguished authors for the mass of English-speaking men. The list of contributors printed in this volume is sufficient guarantee for the excellence of their articles. That they have avoided technical terms as much as possible is evidence of their purpose to make themselves understood by everybody who can understand the English tongue.

* *The New International Encyclopædia*, Vols. I and II, Dodd, Mead & Co., New York, 1902.

There are some other differences which can be accounted for in the same way. In the International many subjects are treated independently in their proper alphabetical places, which have to be hunted up by means of the Index in the Britannica, where they lie buried in some article, which might be called a treatise on the general subject of which the subjects sought form only an inconspicuous part. But the great difference between the two Encyclopædias, and one cannot help thinking the great merit of the International, is the simplicity of its descriptions. Scientific subjects as treated by scientific authors are sometimes difficult to understand, even by highly educated men. To the vast audience who have had few educational advantages, they might as well be written in an unknown tongue. One must concede therefore that the International is likely to become the Encyclopædia of the people.

As an illustration of the differences already noted, let us select a mathematical subject and compare its treatment in the two works. One finds that the subject "Algebra" in the International, is disposed of in less than three pages, whereas in the Britannica over fifty pages are devoted to the subject.

On the other hand "Alcohols," the largest and most important of the carbon compounds, occupies almost three pages of the International, but finds no independent place in the Britannica. One has to consult several volumes of that work, guided by its index, in order to get the information which the International gives, closely packed in a single article in its proper alphabetical place. So one finds a mathematical subject exhaustively treated in the Britannica and merely outlined in the International, while a chemical subject receives liberal treatment in the International, and no independent notice in the Britannica.

Turning now to military subjects, "*Abatis*" finds no independent place in the Britannica, but has to be sought, by help of the index, in the elaborate article on Fortification, whereas in the International it is treated independently in its proper alphabetical place.

The etymology and consequent orthography of this word is differently given by different authorities. Worcester derives it from the French Abattre, to beat down, to fell, and consequently spells it Abattis. Most authorities, however, spell it Abatis. The only objection to the generally accepted spelling of the word is, that there is another word "Abatis," which means a coal mining contrivance built of cord wood, and intended to keep the underground roads open and thus secure ventilation. There is another word "Abatis," now obsolete, but liable to be encountered in reading ancient history, which means an officer of the stable whose duty it was to issue the feed—practically stable sergeant. For these reasons one feels inclined to accept Abattis as the proper spelling in spite of authorities. The Britannica spells it Abattis.

Under the caption "Aeronautics," the Britannica gives one a complete treatise on the subject, covering twenty-three pages of the work, and bristling with mathematical formulas, comprehensible only to expert mathematicians; whereas the International gives one a clear idea of the development of the science and art from Montgolfier's invention to that of Santos-Dumont, in a well packed short article, without any technicalities or abstruse formulas.

As evidence of historical erudition, the article on "Amleth" in the International is an important witness. Few who have read the tragedy or seen the play of Hamlet could have failed to wonder whence Shakespeare got the idea. Saxo Grammaticus, a Danish historian of the 13th century, records the legend, almost identical with the story told in Shakespeare's play, dating the events in

the second century before Christ, and the wonder is how the dramatist and poet got hold of it.

Goethe used to carry a pocket dictionary with him and read it frequently for his personal entertainment. He maintained that it was a collection of articles upon every subject, short articles of course, and without continuity, but interesting for all that. So one feels in regard to an Encyclopædia. Apart from its being a book of reference on any subject, to which one can appeal for particular information, it is a collection of articles which one may read as Goethe did the dictionary—for his amusement, and in course of time he will find that the amusement has been profitable.

* * *

The second volume of this excellent work contains a number of interesting and instructive articles on military subjects, to which a soldier naturally feels constrained to confine his attention.

The article on "Armies" is very interesting. In it one finds accounts of the origin and development of ancient armies, among which those of Egypt, India, Persia, Greece and Rome stand prominently forth. The modern armies of all civilized nations receive similar treatment; so after a study of the short article one gets a fairly clear view of military organization in its ancient and modern forms.

It is interesting to note that as early as 645 years before Christ a standing army became a necessity in Egypt. This army, and indeed all the earlier standing armies consisted of foreign mercenaries, and were manifestly used to keep the subjects of the sovereign in order. For war against foreign enemies resort was had to levies *en masse*. The ancient armies of India and Persia were of this kind, and seem to have been not only numerous but admirably organized and armed for war as practiced in those days.

The ancient armies of Greece consisted of militia, and the famous Macedonian army contained every able bodied Spartan between the ages of 20 and 60 years. With such an army admirably organized, drilled and disciplined, Alexander conquered the ancient empires of Asia.

The armies of Rome, at first a levy *en masse*, organized on civilian lines, became by necessity a standing army as early as 276 years before Christ, receiving a more perfect military organization under Augustus towards the close of the first century B. C. Every able bodied citizen had to serve twenty years, and veterans received a pension.

Modern armies have also arisen and attained their most perfect form, under necessity. The old Feudal System was a breeder of internal strife. Feudal Lords were rarely at peace with all their neighbors, and sometimes even disputed successfully with their king. But the creation of standing armies enhanced the powers of royalty and finally extinguished Feudalism. Armies of mercenaries were essential to the existence of every ambitious monarch, and their maintenance became, in course of time, a burden too heavy to be borne. As a relief therefor, the system now prevailing in Continental Europe was devised. But military rivalry and suspicion has so increased the numerical strength of Continental armies, that the expected financial relief is insignificant, if it is anything at all. The article on armies will prove an interesting and instructive study to any one who reads it with care.

The development of Armor Plate is clearly and concisely described in the article under the caption Armor Plate. Time and again the advocates of Armor

Plate have claimed complete and final victory over the penetrating power of projectiles, and time and again have found themselves mistaken. The contest is still on, and it is difficult to see what the end will be. So long as the armor plate people depended on the thickness of their plates there was a limit to their development. Since hardness has been invoked, there seems to be no limit.

Army Organization is sketched in a short article, in which one discovers nothing new, except it be Mounted Infantry and Machine-gun Batteries. Mounted Infantry exists in British armies only, at present, and there only in time of war, and then only in what may be called irregular warfare. If, however, it is a necessity in war of any kind it should find a place in the peace establishment. Long range rifles have produced long range fighting; and long range fighting calls for long distance manœuvring; and long distance manœuvring for infantry troops demands transportation of some kind; and the horse seems to be the handiest. And so one may expect that Mounted Infantry will become a recognized part of every regularly organized army. As to Machine Gun Batteries, they are tactically on trial. What the result will be is problematical. They cannot do artillery work and yet they seem to be indispensable. Perhaps a special corps will be created for their service.

The development of Artillery as sketched under that caption, is an interesting study. When any such history is drawn to a focus so that the eye can take in all its parts at a glance, one is generally disappointed at the slowness of the march of improvement. More has been done in the last fifty years than in the centuries that preceded them. The clumsiness of artillery machines and material, and the utter absence of anything about it deserving the name of Mobility during the first 300 years of its existence and use as a weapon of war, is, to say the least, astonishing. That there were many men in those days with active and inventive minds is manifested by their excellent work in other departments. That the improvement of artillery was neglected must be accounted for in some other way. One is forced to the conclusion that artillery development "stuck in the mud" so long, because inventors hardly knew of its existence. A drilled and disciplined soldier is the last man to dream of improvements. He has been trained to manipulate things as they are, and any alterations in the things would, in his estimation, be treason against the drill book. Martin Burke of the 3d Artillery, protested against the introduction of percussion caps, and the Duke of Wellington disapproved of the rifle as a military arm. It was not until actual war turned the thoughts of inventive minds towards arms in general and artillery machines and material in particular, that any satisfactory progress was made. Then however, the progress was phenomenal. Governments had hardly finished arming their artillery with new and improved weapons, when the march of invention made their new weapons obsolete. For fifty years the advance has been by leaps and bounds, and there is no end to it in sight yet.

The Science of Ballistics is clearly and concisely treated in a six-page article, and without any of those formidable formulas which deter the general reader from approaching the subject. The article opens, as it should, with definitions of those technical terms, without the use of which Ballistic problems can hardly be stated or discussed. Then follows a condensed history of the science from its discovery by Bejamin Robins in 1700 through Hutton, D'Arcy, Rumford and others down to our own General Rodman and Captain Noble of England.

The problem of prime importance in Ballistics is the determination of the

pressure developed by the gases evolved in the explosion of gunpowder in the chamber of a gun. The progress of a projectile through the bore of a gun, and its velocity at the muzzle depend on that pressure. The first is known to the profession as Interior and the second as Exterior Ballistics.

The pressure resulting from an explosion of gunpowder in the chamber of a gun can be measured in two ways, first by its cutting effect upon a disc of pure copper by a knife or chisel acted upon by the explosive force of the powder; and second by the crushing effect of such explosion on a small cylinder of pure copper exposed to the full force of the explosion in a similar way. The first is known as Rodman's method and the second as Noble's.

The gauges used in both methods are very much alike. Rodman's consists of a strong metal cylinder, inside and at the bottom of which is placed the disc of pure copper already mentioned. The knife or chisel resting upon the disc is the lower end of a piston, the upper end of which is exposed to the pressure resulting from the explosion. The instrument is excellently illustrated in the article under discussion. The pressure is determined by the depth or rather length of the cut. As the chisel edge is circular, the greater the pressure, the longer the cut. The apparatus, properly prepared, is placed inside the cartridge bag before the cartridge is inserted in the gun. When the gun is fired it generally drops at the muzzle, though sometimes it remains in the gun.

Captain Noble's plan is very similar, the only difference being that a small cylinder of pure copper is used instead of a disc, and is crushed and thus shortened, instead of being cut. These methods are called *static*. There are other methods called *kinetic*, less simple, and perhaps no more accurate than the pressure and crusher gauges just described. As a matter of fact both systems give practically the same results.

The discussion of Exterior Ballistics is introduced by another series of definitions; a history of its development; and a description of ballistic machines past and present. The earliest of these machines, namely the ballistic pendulum and the gun pendulum, were intended to measure the momentum of the projectile as it left the bore of the gun. Later and more perfect machines aim at measuring the time it takes the projectile to traverse a given space. Many machines have been devised for this purpose, the simplest and perhaps the best among them being Boulengé's chronograph.

The treatment of this complicated subject in the article under discussion is so simple, and the language used so clear and distinct, that any reader of average intelligence can have no difficulty not only in understanding the machines, but also in comprehending the science.

The publishers have taken pains to clothe the "International" in a handsome dress as to paper, print, illustrations and binding.

JAMES CHESTER,
Major of Art'y. Retired.

The White World.*

This book, as its name indicates, pertains to the Arctic regions. Twenty-two living members of the Arctic Club of America have written of their personal experiences in the far North, in attempts to reach the North Pole; and have described, and in many instances illustrated, what interested them most. The

* *The White World*, Life and Adventures within the Arctic Circle. By R. Kersting. New York. Lewis Scribner & Co., 1902.

book is published under the auspices of the Arctic Club, and the royalties from its sale accrue to the Club's treasury. Among the writers of the stories are Admiral Schley, U. S. N., Major Brainard, U. S. A., and Henry Biederbick.

The fascination of the Arctic regions, notwithstanding its perils and its hardships, seems to possess an ever lively interest to men of an adveuturous inclination. The quest of the hitherto unattainable seems to be the patent attraction. Admiral Schley asks "If the first Polar explorer had successfully accomplished his purpose and discovered the North Pole, would there have been any further expeditions? This in my opinion, is more than doubtful." "And this brings us to the ever persistent question, *Cui bono?* What is the use of it all?" "Would the knowledge of the exact position of the North Pole be a boon to humanity, etc.?" "Even if these questions were answered authoritatively in the negative, that would not detract from the splendid aims, the marvellous endurance and the glorious heroism which have ever been displayed in an eminent degree by Arctic explorers." "In spite of all the search for the North Pole still goes on, and probably will go on indefinitely." Peary has just returned from another expedition and very probably will go again. He says he "is after the Pole because it is the Pole; because it has a value as a test of intelligence, persistence, endurance, determined will and perhaps courage; qualities characteristics of the highest type of manhood; because I am confident it can be reached."

Admiral Schley's graphic account of the finding of the remnants of the lost Greely Expedition loses none of its incessantly recurring interest, and forms the introductory article to a very interesting and useful series of stories.

Major Brainard describes the experiences of the Greely Expedition of which he was a member. He takes occasion in his story to speak of the intelligence and usefulness of the Arctic dog, which he states surpasses understanding. "Each pack of Greenland dogs has an acknowledged leader, an absolute autocratic king, who has won his way to supremacy by fighting every other dog who dared to enter the lists against him. Likewise each team has its king, and this dog exercises undisputed sway over the others, enforcing discipline and administering punishment whenever, in his judgment it is necessary." "From day to day we grew to depend much upon the superior intelligence of Ritenbenk (the dog leader) in passing our sledge over difficult places, and in plowing our way through the deep snow, now made soft by the rising temperature. When the driver gave the signal to start, Ritenbenk would jump to his feet, uttering his orders to his subordinates in quick short barks, at the same time pressing into his harness with all his strength. Woe to the unfortunate dog who did not respond with alacrity to his commands, for the punishment was swift, sure and effective. We watched Ritenbenk with great solicitude and one day when he was sick and staggered along with drooping ears and tail, we were all depressed. That night he was offered a place in the tent, protected from the storm, but, ill though he was, he scorned such a resting place, preferring to share the bed of snow with his fellows." One feels anxious to know what became of Rittenbenk. Major Brainard does not tell us.

Dr. Frederic A. Cook tells us of the physical trials and effects of life in the Polar Regions. He says "It is the universal opinion that polar explorers suffer mostly by reason of the intense cold, and that success or failure is due to the powers of enduring low temperatures; but this is far from the truth. True, there are snow and ice everywhere in evidence; snow falls during the Summer

as well as Winter. For this, however, we are prepared. Suitable garments so fit the body that one does not really suffer much more from the effects of cold than does a New Yorker in Winter; and we avoid the life-reducing heat of the home Summers." "No, it is not the cold which makes the life of the frigid explorers hard: It is the hopelessness of the unimaginable isolation from the accustomed walks of life."

We might go on and extract from each of the twenty-two articles, items of interest, Indeed, they are all interesting throughout and cover all the phases of Arctic life. So much information on this subject has never heretofore been brought between the covers of one volume which is an imperial octavo, well printed and illustrated by seventy portraits and views. R.

National Register S. S. A. R.

The National Register of the Society of the Sons of the American Revolution, just published, under the auspices of the Society, by Louis H. Cornish, 239 Broadway, New York, is a substantial indication of the strength of this most numerous of the patriotic-hereditary organizations. The book consists of 1,035 pages, 6½ by 10 inches in size, closely filled with brevier type, devoted chiefly to giving the names of the members of the organization, their ancestry back to the Revolution, and the service of the ancestor by virtue of which they are entitled to membership. The ancestral lines are of great value to those interested in genealogical matters, and this part of the book alone makes the volume a useful contribution to library shelves. In addition, the book contains biographical sketches of the general officers and many members; a history of the organization; its constitution and by-laws; a calendar of the principal events of the Revolution; and a list of Sons of the American Revolution to whom the National Society has presented medals in recognition of their services in the War with Spain. The latter shows that about 600 of the 10,000 members actively participated in the late war. The volume is illustrated with 150 engravings, 40 being of subjects of historical interest, such as Fraunces' Tavern and the Jumel Mansion, New York, Independence Hall, Philadelphia, etc., and the remainder are portraits.

In running over the lists of the different States, one sees many names illustrious in our national annals. They include those of the late President McKinley, President Roosevelt, General Miles, Admiral Dewey, Associate-Justice David J. Brewer of the United States Supreme Court; our Ambassador to France, Gen. Porter; our late Ambassador to Spain, Gen. Woodford; ex-Vice President Morton; United States Senators Chauncey M. Depew, John W. Daniels, Marcus A. Hanna, Henry C. Lodge, Orville H. Platt, and Redfield Proctor; Generals Simon B. Buckner, Frederick D. Grant, A. W. Greely, Charles King, Thomas M. Anderson, Wm R. Shafter. Joseph Wheeler, etc.

The book is substantially bound in blue, white and buff buckram, recalling the colors of the Continental uniform of the men of the Revolution. The work shows a great deal of painstaking care on the part of the compiler and publisher, Mr. Cornish, and Mr. A. Howard Clark of the Smithsonian Institution, the experienced genealogist of the National Society who collated and edited the lists of members and their genealogies. It is highly creditable to the organization which it represents and should materially promote the prosperity of which it is such a substantial indication.

Those who take pride in the record of New York State in the Revolution

will wish that the table of troops furnished by the different States, copyrighted by F. B. Heitman of Washington in 1892 and given on page 106 of the present work, had been corrected in the light of the discoveries made by Comptroller James A. Roberts, and published under the authority of the State of New York in 1899. Heitman's table credits New York with having furnished 17,781 men to the Continental Line and 10,000 militia. Comptroller Roberts, however, discovered documents from which he compiled a list of no less than 63,645 men who served from New York State in the War of the Revolution. Assuming that Heitman's figures for the other States are correct, Comptroller Roberts' discoveries raise New York from the fifth to the second rank in her contributions to the military strength of the struggling colonies.

It is interesting to note from the figures given on page 12 of the book before us that Massachusetts, which furnished the most men for the war, leads the State societies with 1400 members, while New York, which ranked second in the number of men furnished during the war, ranks second also among the societies with 1,205 members. E. H. H.

Our Exchanges.

Military.

Armée et Marine.—August 24. Cavalry Evolutions. Army Manœuvres of 1902. The Distance Ride, Brussels-Ostend. The new Field Cannon of 75 Millimeter. Travel in Extreme Orient. August 22.—The Crowning of the King of England. The Arab horses and the Remount of the French Cavalry. Our Sub-Marine Navigation. Sept. 14.—At the Grand Manœuvres in the South of France. The Retired Officers. Explosion in a Cartridge Manufactory. Passage of troops over rivers. Sept. 21.—At the Grand Manœuvres. The Prince of the Asturias. The Manœuvres of the South. In Honor of the Foreign Officers.

Internationale Revue.—September. The Army of Italy. Mercenary and National Armies. The Artillery accident on board the *Mars*. The Protection of Railroads in time of War. Increase of the German Army. The German Naval Manœuvres. New Handbook for the German General Staff Officers. The Future Garrisons of Great Britain in South Africa.

Journal of the Royal United Service Institution (London).—August. Snapshots taken by an Officer at Rustenburg during the Boer Surrenders. A reserve for the Navy from the Navy. On Military Education in England from a National and an Imperial Point of View. A study of the late M. Jean de Bloch's Theories as applied to the question of Sea Power. The Peace in South Africa. Suggestions for an Imperial Militia Service. September.—Snapshots taken by an Officer at Rustenburg during the Boer Surrenders. What should be the Disposition of the Matériel and Personnel of the British Navy in Time of Peace, and how can the Peace Strength be most rapidly expanded to War Strength? Education and its Ancillary, The Military Problem. Personal Reminiscences of a Free State Burgher during the Investment of Ladysmith. Reconnaissance as a Fine Art under the present Conditions of War.

Journal of the United Service Institution of India.—July. The Training and Equipment of Cavalry and Mounted Infantry in India, and their respective Rôles in War (Gold Medal Prize Essay and second Prize Essay). Horse Breeding in India. The relative Functions of Cavalry and Mounted Infantry. The Foreign Contingents in China. Further Notes from the Transvaal.

Journal of the United States Artillery (Fort Monroe, Va.).—July and August. Plotting Board for Mortars. Firing Mortars at Moving Targets. Manual for the 12-inch Breech Loading Mortar. Construction of a Difference Chart. Triangle for Telemetric Calculations. French Field Artillery. Method of laying heavy Guns. Late Developments in Ordnance and Armor. Commentaries on Contemporaneous Art of Defense. Sept.-October.—Report on the Mounts and Means of Ammunition Supply at the R. F. Gun Batteries at Fort Pickens and Fort McRee, Fla. A Set-back Chart for Mortars. A Predicting and Set-back Ruler. Fighting Books. Defense for Secondary Forts against probable Enemies, based upon an appreciation of peculiarities of the Personnel and Matériel in such Enemies. Thoughts on Coast Defenses suggested by the Boer War.

Journal of the Association of Military Surgeons.—August. The most practical Organization for the Medical Department of the United States Army in Active Service. (The Sander Prize Essay.) Note on Bolo Wounds. The New Ohio Medical Department Law. Necrology of the Association for 1901–1902. Education of Medical Officers for the Public Service. Original Medical Investigations of the Surgeons of the Imperial Japanese Army. Retirements for Age in the Army Medical Department. The Relations of Personnel to Bed-Capacity in Military Hospitals. The most practical Organization for the Medical Department of the United States Army in Active Service. (Prize Essay.)

La Belgique Militaire.—August 24. Congress of the National Belgium Federation of the old soldiers of 1870–71. International Military Distance-riding. Brussels-Ostend. Federation of Non-com. Officers. The Commission for the Armament of the Artillery. The Royal Federation of ex Non-commissioned Officers in Holland. August 31.—Fighting of Cavalry against Cavalry. The race of Brussels-Ostend. A Camp for Manœuvres West of Brussels. Military International Distance-riding. The Commission for the Armament of the Artillery. Sept 14.—England and small States. The race of Brussels-Ostend. National Federations of the old Soldiers, 1870-71. The Commission for the Armament of the Artillery (Continued). The effective Peace Strength of the German Army. Sept. 21.—The formations and evolutions of Cavalry. The Riding School. Naval power of the different countries. Enlistments of Volunteers and the pay.

Proceedings of the Royal Artillery Institution.—April and May. Recruiting for the Royal Artillery. Narrative of a Boer. Horse Management in South Africa. Observation of Fire from a Flank. Defense for Secondary Forts Against Probable Enemies Based upon an Appreciation of Peculiarities of the Personnel and Matériel in such Enemies. Recent Development of Field Artillery Matériel on the Continent. Norway and Sweden. Signalling for Horse and Field Artillery. The First Electric Instrument for Measuring the Velocity of Projectiles. A Useful Method of Enhancing the Mobility of Mountain Guns when Required to Move with Mountain Troops. June and July.—Has the Experience of the War in South Africa shown that any Change is Necessary in the System of Field Artillery Fire Tactics (in the attack as well as in the defense) in European Warfare? The Western Glacis of India. Rapidity of Fire and our Present Fire Discipline. Recent Development of Field Artillery Matériel on the Continent. Field Howitzers. Garrison Companies Abroad.

Revue du Cercle Militaire.—August 30. Artillery March. On the subject of Andree's Expedition. The Cavalry in Africa The Normal School of Gymnastics and Fencing. Sept. 6.—Three Years of Field Service in the Valley of Thad. Formation of an Auxiliary Corps of Gendarmery at Madagascar. Service of Military Telegraphy. Sept. 13 —The English Army and the System of Recruiting. The Great Imperial German Manœuvres. The British Naval War Squadron. Sept. 20.—Reorganization of the Swedish Army. Italian Military Literature. A New Colonial Infantry Brigade. The Grand German Naval Manœuvres. Experiences with Automatic Canons in England. The New Uniform for the U. S. Army. Sept. 27.—Tactical Competition. Designs of High Bridges for Passage of Troops. The Wireless Telegraphy in Germany. The British Officers' Messes and Quarters.

Revue Militaire des Armées Étrangères.—August. The Army Budget of the German Empire for 1902. The Mobilization and Concentration of the Germans in 1870, (Continued). Studies of the South African War 1899–1900, (Continued). September.—Studies of the South African War, (Continued). Army Budget of the German Empire for 1902, (Continued). The Mobilization and Concentration of the Germans in 1870, (Continued).

Revue D'Artillerie.—July. Automatic Pistols. Operations in the Deserts of Sahara. Automatic Machine Guns, Colt. August.—Operations in the Deserts of Sahara, (Continued). An Italian and a German opinion of the Rapid Firing Gun. Construction of Cannon and Mortars in Germany and Austria. Special Ammunition for Target Practice in Austria. The Russian Artillery at the Summer Manœuvres in 1902.

Revista di Artiglieria E Genio.—July-August. Experiments with Electrical Traction on Italian Railways. The Field Telegraph of the Italian Volunteers in the Campaign of 1866. Questions relating to the Defensive Organization of the Italian Frontier. Some Proposed Modifications in the Bridge Section and the manner of placing the Trestles in the water. Information on the Portable Arm. Naval Armor and Armament.

United Service (N. Y.).—September. Education of Officers. A Tangled Web. Across the New Northwest in 1860. Depths of the Sea. Rear-Admiral Francis J. Higginson, U. S. N. October.—The Training of Army Officers. A Forgotten American Humorist. A Tangled Web (Continued). Organization of Coast Defense. Lessons of the South African War. The Combined Navy and Army Manœuvres. The Loss of the U. S. Steamship Mississippi.

United Service Gazette. (London).—Aug. 23. The Relief of Ladysmith. The Coronation of Edward VII. The Naval Review. A Desirable Combine. Volunteer Forces in India. Sept. 6.—The Coronation Naval Review. Cavalry and Mounted Infantry. Military Motor-Lorry trials. The Ordnance Survey. Indian Medical Service. Railway Work in the Boer War. Sept. 13.—Destroyers as a Factor in Naval Warfare. The Army in South Africa. Mr. Chamberlain and the Boer Generals. Second Army Corps Shooting Competition. Home Stations of Troops returning from South Africa. Decentralization of Duties. Sept. 20.—Military Education National Rifle Match. Continental Army Tactics. Madeira.—Considered as the Key to the Mediterranean. Enteric among Armies. The Indian Trooping Season.

United Service Magazine (London).—September. The Coronation. Comparison of Battle-ships. England, France and Russia. Colonial Contributions to the Navy. Armed Merchant Vessels. An Extinct Training-School for the Fighting Services. Offensive Tactics in Modern War. Strategy and Tactics in Mountain Ranges. The Employment of Infantry and Artillery in Action Cavalry Remounts. The Passing of the Chinese Regiment. The Expenses of Officers. October.—Imperial Defense and Colonial Responsibilities. Imperial Garrisons. Canteens in H. M. Ships. Strategy and Tactics in Mountain Ranges, (Continued). Rifle Practice. Military Education. National Apathy and National Necessities. The Training and Equipment of Cavalry and Mounted Infantry in India, and their Respective Rôles in War. Machivelli on the Art of War. The Passing of a Commando. A Russian Trip through Persia and Persian Beluchistan. A forgotten English Victory.

Naval.

Revista Maritima Brazileira.—April and May. Extract from the Report of the Cruise of the 3d Naval Division in General Manœuvres. The Commander-in-Chief. Suggestions for the Reorganization of our Military Marine. The applications of Physical Chemistry. The necessity of a Navy. The Law Course in the Naval School. Commercial and Industrial Resources of Brazil. July.—The 22d year of the Revista. Extracts from the Report made to the Admiral-Chief of the General Staff of the Navy by Captain Alexandrina Faria de Alencar, Commanding the Torpedo Division. Airships of Santos Dumont and Severo. Light Houses.

Bolotin Del Centro Naval.—June. Latarel Keels (Continued). Merchant

Marine. Engines (steam) in Naval Warfare. Report of the Minister of Marine. The combustion of Petroleum. A Manual for Sergeants of Marine Artillery. Proceedings of the United States Naval Institute. September.—The employment of Petty Officers in the Navy. The Training of Landsmen for the Navy. Some Thoughts on our Ordnance Material. On Naval Operations of the Crimean War. Military Operations and Defenses of the Siege of Peking. The Signal Question once more. Some Experiences on Board the U. S. S. Manila. Graphic Solution in Coast Navigation. Methods for finding the Intersection of two Summer Lines.

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La Engeneira; regular issues, to date.

La Revue Technique; regular issues, to date.

Political Science Quarterly; regular issues, to date.

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Pennsylvania Magazine of History and Biography; regular issues, to date.

Review of Reviews. October. The United States and Mexico at the opening of the Hague Court. The Philippine Constabulary and its Chief.

The Scientific American; regular issues, to date.

The Dial; regular issues, to date.

The Popular Science Monthly; regular issues, to date.

The Seventh Regiment Gazette; regular issues, to date.

The Medical Record; regular issues, to date.

The Century Magazine; regular issues, to date.

The Army and Navy Journal; regular issues, to date.

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The White World; Life and Adventures within the Arctic Circle, Portrayed by Famous Living Explorers. Lewis Scribner & Co., N. Y.

Strategic Value of Her West Indian Possessions to the United States. By Capt. W. V. Judson, Corps of Engrs., U. S. A., Philadelphia (Reprint).

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Le Petit Soldat, Manuel des Princpales Institutions Militaires et Guide Practique en Pays Ennemi. By R. Kron, Karlsruhe, Bavaria. 1902.

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